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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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March 11, 1980

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CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	992 OG 12
Reissue Applications Filed	992 OG 12
Patent Notices	
Certificates of Correction for the Week of March 11, 1980	992 OG 13
Dedications	992 OG 13
Disclaimers	992 OG 13
Certain United States Semisynthetic Penicillin Patents Available for License	992 OG 13
Patents Available for Licensing or Sale	992 OG 13
National Technical Information Service	992 OG 14
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	992 OG 17
Condition of Patent Applications	992 OG 18
Reissue Patents Granted (30,224)	375
Plant Patents Granted (4,509)	379
Patents Granted	
General and Mechanical (4,192,017)	381
Chemical (4,192,647)	599
Electrical (4,192,962)	687
Design Patents Granted (254,396)	745
Index of Patentees	PI 1
Indices of Applicants of Reissues, Plants and Designs	PI 39
Classification of	
Patents (Including Reissues)	PI 41
Designs and Plants	PI 43
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 44
Designs and Plants	PI 45
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

Jan. 28, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,590,419, Re. S.N. 103,515, Filed Dec. 13, 1979, Cl. 16/135, QUICKLY ATTACHABLE AND DETACHABLE HINGE ASSEMBLY, Carl J. Dargene, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 353

3,732,131, Re. S.N. 086,976, Filed Oct. 22, 1979, Cl. 149/18, GUN PROPELLANT CONTAINING NITROPLASTICIZED NITROCELLULOSE AND TRIAMINOGUANIDINE NITRATE, Vernon E. Haury, et al., Owner of Record: *Rockwell International Corp., El Segundo, Calif.,* Attorney or Agent: L. Lee Humphries, et al., Ex. Gp.: 223

3,938,603, Re. S.N. 052,077, Filed Jun. 25, 1979, Cl. 177/211, CONSTANT MOMENT WEIGH SCALE WITH FLOATING FLEXURE BEAM, Ralph S. Shoberg, et al., Owner of Record: *GSE Inc., Farminston Hills, Minn.,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 211

3,968,745, Re. S.N. 104,344, Filed Dec. 17, 1979, Cl. 101/111, LABEL PRINTING AND APPLYING APPARATUS, Paul H. Hamisch, Jr., Owner of Record: *Monarch Marking Systems, Inc., Dayton, Ohio,* Attorney or Agent: Joseph J. Grass, Ex. Gp.: 337

4,043,152, Re. S.N. 094,171, Filed Nov. 14, 1979, Cl. 066/9 R, INLAY WHEEL AND METHOD, David J. J. Bryars, Owner of Record: *Austen Bryars of London Inc., Greensboro, N.C.,* Attorney or Agent: Clifton T. Hunt, Jr., Ex. Gp.: 353

4,045,233, Re. S.N. 048,277, Filed Jun. 13, 1979, Cl. 106/57, REFRACTORY COMPOSITION AND METHOD FOR PREPARATION, Everett A. Thomas, et al., Owner of Record: *Didier Taylor Refractories Corporation, Cincinnati, Ohio,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 113

4,056,953, Re. S.N. 092,584, Filed Nov. 8, 1979, Cl. 64/30 D, TORQUE LIMITING COUPLING, James L. Furlette, et al., Owner of Record: *Excel Corporation, Fenton, Mich.,* Attorney or Agent: Ernest I. Gifford, et al., Ex. Gp.: 345

4,063,060, Re. S.N. 101,846, Filed Dec. 10, 1979, Cl. 219/93, METHODS OF MAKING TORSIONAL VIBRATION ISOLATING MOTOR MOUNTING SYSTEMS AND ARRANGEMENTS, Ernest W. Litch, III, Owner of Record: *General Electric Company, Fort Wayne, Ind.,* Attorney or Agent: John M. Stoudt, et al., Ex. Gp.: 213

4,064,524, Re. S.N. 104,270, Filed Dec. 17, 1979, Cl. 357/24, TWO-PHASE CHARGE TRANSFER DEVICE IMAGE SENSOR, Yoshiaki Hagiwara, et al., Owner of Record: *Sony Corporation, Tokyo, Japan,* Attorney or Agent: James Van Santen, et al., Ex. Gp.: 254

4,065,185, Re. S.N. 104,099, Filed Dec. 17, 1979, Cl. 299/86, POINT-ATTACK BIT, Gerald W. Elders, Owner of Record: *Inventor,* Attorney or Agent: Frank B. Powell, et al., Ex. Gp.: 354

4,121,705, Re. S.N. 104,329, Filed Dec. 17, 1979, Cl. 192/89 B, WEAR RING FOR SPRING OF FRICTION COUPLING, Richard L. Hedgcock, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Charles L. Rowe, Ex. Gp.: 352

4,138,876, Re. S.N. 100,440, Filed Dec. 5, 1979, Cl. 72/457, TRUCK FRAME ALIGNMENT APPARATUS, Finis L. Chisum, Owner of Record: *Inventor,* Attorney or Agent: James R. Head, et al., Ex. Gp.: 321

4,145,410, Re. S.N. 103,463, Filed Dec. 14, 1979, Cl. 424/19, METHOD OF PREPARING A CONTROLLED-RELEASE PHARMACEUTICAL PREPARATION, AND RESULTING COMPOSITION, Barry D. Sears, Owner of Record: *Inventor,* Attorney or Agent: Richard P. Crowley, et al., Ex. Gp.: 125

PATENT NOTICES

Certificates of Correction for the Week of Mar. 11, 1980

D. 253,450	4,127,716	4,156,868	4,170,922
3,905,739	4,128,242	4,157,184	4,171,265
3,953,335	4,129,486	4,159,717	4,171,364
3,956,417	4,129,820	4,160,688	4,171,486
3,975,220	4,132,866	4,162,057	4,171,656
4,019,154	4,134,044	4,163,470	4,172,081
4,032,583	4,135,347	4,163,594	4,172,124
4,035,446	4,136,560	4,163,664	4,172,384
4,055,358	4,136,867	4,164,656	4,173,251
4,072,200	4,139,904	4,164,711	4,173,830
4,090,968	4,140,662	4,165,239	4,174,202
4,092,920	4,143,182	4,165,482	4,174,960
4,098,742	4,147,078	4,167,685	4,175,575
4,099,478	4,148,117	4,167,847	4,175,706
4,105,625	4,148,566	4,168,157	4,175,997
4,111,817	4,148,762	4,168,680	4,176,762
4,114,417	4,150,901	4,168,905	4,177,466
4,117,354	4,154,568	4,169,318	4,178,560
4,124,702	4,154,987	4,170,062	4,179,382
4,126,485	4,155,479	4,170,156	4,179,390
4,126,749	4,156,754	4,170,185	4,180,678

Dedications

3,835,997.—*Heinrich Hartmann* and *Siegfried Stelter,* Hondelage, and *Heinz-Guenter Trelewsky,* Braunschweig, Germany. MOBILE DEVICE FOR RECEPTION, PRECLEANING AND PILING OF BEETS. Patent dated Sept. 17, 1974. Dedication filed Dec. 3, 1979, by the assignee, *Braunschweigische Maschinenbauanstalt.*

Hereby dedicates the entire remaining terms of said patent.

4,164,267.—*Sam W. Meineke* and *Harold Nedell,* Bellaire, Tex. EXHAUST MUFFLER. Patent dated Aug. 14, 1979. Dedication filed Jan. 14, 1980, by the assignee, *Meineke Discount Muffler Shops, Inc.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,696,876.—*Eugene G. Ott,* Dallas, Tex. SOFT FORMATION INSERT BITS. Patent dated Oct. 10, 1972. Disclaimer filed Jan. 14, 1980, by the assignee, *Dresser Industries Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,096,326.—*Albert R. Reid,* Hockessin, Del. DIHYDROXYPROPYL CELLULOSE. Patent dated June 20, 1978. Disclaimer filed Mar. 28, 1979, by the assignee, *Hercules Incorporated.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,102,155.—*Frank Robinson, Nigel Stephen Whatmough,* Breaston, England. KNITTING METHOD. Patent dated July 25, 1978. Disclaimer filed Dec. 3, 1979, by the assignee, *Courtaulds Limited.*

Hereby enters this disclaimer to claims 12 and 13 of said patent.

4,154,931.—*Reinhard H. Richter,* North Haven, *Benjamin W. Tucker,* Bethany, and *Henri Ulrich,* Northford, Conn. PROCESS FOR THE PREPARATION OF CYCLIC UREAS. Patent dated May 15, 1979. Disclaimer filed Jan. 24, 1980, by the assignee, *The Upjohn Company.*

Hereby enters this disclaimer to claims 1 through 6 inclusive of said patent.

Certain United States Semisynthetic Penicillin Patents Available for License

Beecham Group Limited and Beecham Inc. have available for license, at reasonable royalty rates, certain specified United States semisynthetic penicillin patents. The patents are those defined in and limited by a May 21, 1979 Final Judgment agreed to by Beecham and the United States Government in Civil Action No. 822–70 (United States District Court for the District of Columbia). Technical data, again as defined in and limited by the Final Judgment, is also available for license at certain costs and/or royalties in connection with ampicillin, patents licensed and certain bulk purchases of semisynthetic penicillins all as set forth in the Final Judgment. Further information may be had from Beecham Inc., 65 Industrial South, Clifton, New Jersey, Attention: Mr. Albert J. White, General Counsel.

Dated: Feb. 21, 1980.

ALBERT J. WHITE,
General Counsel.

Patents Available for Licensing or Sale

4,179,080. IMPROVED DOLLY. Henry A. Patnaude, 831 Los Moldinos Way, Sacramento, Calif. 95825.

4,000,767. LEVERAGE SCREWDRIVER. Jerome F. Geng, 94 Hillside Court, Fox Lake, Ill. 60020.

4,100,905. FUEL VAPORIZER. Joe M. Nolan, Box 1263, Longview, Tex. 75606.

4,172,501. SELF PROPELLED CAGE WHEEL TRACTOR. Roger L. Murray, 3938 Shimer Road, Marysville, Calif. 95901.

4,132,001. DIRECT READING RADIUS GAUGE. Konrad Petrik, 205 Meadowlawn Road, Cheektowaga, N.Y. 14225.

The following patent is available for licensing or sale. Correspondence to: Karl Hou, 29 East Maple St., Teaneck, N.J. 07666.

4,144,041. ADJUSTABLE THROAT VENTURI SCRUBBER.

The following patents are offered by Sargent-Welch Scientific Company, 7300 North Linder Ave., P.O. Box 1026, Skokie, Ill. 60077.

3,103,073. INSTRUCTOR SYSTEM.

3,123,920. INSTRUCTION SYSTEM.

3,274,703. TEACHING MACHINES.

3,545,100. SELECTO-MECHANISM.

3,608,208. TEACHING MACHINES.

4,043,054. TEACHING MACHINES.

General Electric Company is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patents should be addressed to: Patent Counsel Drive Systems Department, General Electric Company, 1501 Roanoke Blvd., Salem, Va. 24153.

3,207,339. CONTROL APPARATUS.

4,019,105. CONTROLLED CURRENT INDUCTION MOTOR DRIVE.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

4,175,615. PIPE HEADER-CYLINDRICAL TANK JOINT AND METHOD OF JOINING SAME.

Application for license should be addressed to Group Patent Counsel, Lighting Business Group, General Electric Company, Nela Park, Cleveland, Ohio 44112.

3,968,398. FUSED DECORATIVE STRING SET.

3,944,961. MECHANICALLY IMPROVED CONTACTS FOR RADIATION SWITCHES HAVING MATERIAL THAT CONVERTS FROM ELECTRICALLY NON-CONDUCTIVE TO CONDUCTIVE.

3,951,582. SWITCHING DEVICES FOR PHOTOFLASH UNIT.

3,957,694. RADIATION CURABLE INKS.

3,968,056. RADIATION CURABLE INKS.

3,969,065. SWITCHING DEVICES FOR PHOTOFLASH UNIT.

3,969,066. SWITCHING DEVICES FOR PHOTOFLASH UNIT.

3,969,067. PHOTOFLASH LAMP.

3,972,673. PHOTOFLASH LAMP.

3,974,304. METHOD OF MAKING A VOLTAGE RESPONSIVE SWITCH.

3,976,811. VOLTAGE RESPONSIVE SWITCHES AND METHODS OF MAKING.

3,988,647. METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY.

3,989,644. RADIATION CURABLE INKS.

3,990,832. SWITCHING DEVICES FOR PHOTOFLASH UNIT.

3,990,833. SWITCHING DEVICES FOR PHOTOFLASH UNIT.

3,994,664. PARALLEL ELECTRICAL SWITCHES.

4,013,848. SPRING SHORTING MEANS FOR PHOTOFLASH ARRAY.

4,015,028. METHOD FOR FORMING AN IMPROVED CONTACT FOR A RADIATION SWITCH.

4,015,093. PHOTOFLASH ARRAY HAVING ELECTRICAL SHORTING MEANS.

4,019,043. PHOTOFLASH LAMP ARRAY HAVING SHIELDED SWITCHING CIRCUIT.

4,028,798. METHOD OF MAKING ELECTRICAL CONNECTIONS.

4,036,578. PHOTOFLASH ARRAY AND METHOD OF CONSTRUCTION.

4,039,273. PHOTOFLASH LAMP PROVDIING AFTERFLASH SHORTING.

4,040,777. FLASH LAMP ARRAY HAVING SHORTING LAMPS.

4,041,300. PHOTOFLASH ARRAY WITH DISCHARGE PATH FOR ELECTROSTATIC CHARGES.

4,045,712. VOLTAGE RESPONSIVE SWITCHES AND METHODS OF MAKING.

4,047,015. PHOTOFLASH ARRAY CONSTRUCTION.

4,048,487. LAST-FLASH INDICATOR SWITCH IN PHOTOFLASH ARRAY.

4,048,716. METHOD OF MAKING ELECTRICAL CONNECTIONS.

4,049,844. METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY.

4,051,359. ELECTRIC MULTIPLE FLASH ARRANGEMENT.

4,053,757. PHOTOFLASH LAMP ARRAY HAVING RADIATION SWITCHES AND FLASH INDICATORS.

4,060,721. PHOTOFLASH LAMP ARRAY HAVING CONDUCTIVE REFLECTOR.

4,064,431. LAST-FLASH INDICATOR FOR PHOTOFLASH ARRAY.

4,080,155. SWITCHING DEVICES FOR PHOTOFLASH UNIT.

4,088,801. U.V. RADIATION CURABLE ELECTRICALLY CONDUCTIVE INK AND CIRCUIT BOARDS MADE THEREWITH.

4,093,979. MULTIPLE FLASH ARRAY.

4,097,220. FLASH LAMP ARRAY HAVING SHORTING LAMPS.

4,101,953. MULTIPLE FLASHLAMP ARRAY.

4,104,705. PHOTOFLASH LAMP ARRAY HAVING SHIELDED SWITCHING CIRCUIT.

4,104,706. PHOTOFLASH LAMP ARRAY HAVING CONDUCTIVE REFLECTOR.

4,105,480. FLASHLAMP COMPOSITION.

4,118,758. PHOTOFLASH LAMP ARRAY HAVING HIGH VOLTAGE SHORTING TYPE FLASH LAMPS AND RADIATION SENSITIVE SWITCHING ELEMENTS.

4,128,858. MULTIPLE FLASHLAMP SYSTEM.

4,133,023. FLASH LAMP ARRAY HAVING ELECTRICAL SHIELD.

4,133,631. PHOTOFLASH LAMP ARRAY CIRCUIT BOARD HAVING RADIATION SENSITIVE FUSE ELEMENTS.

4,136,375. SHIELD CONNECTION IN PHOTOFLASH ARRAY.

4,136,376. PHOTOFLASH LAMP ARRAY CIRCUIT BOARD HAVING ELECTRICAL INSULATION.

4,136,378. PHOTOFLASH LAMP ARRAY HAVING REFLECTOR AT REAR OF TRANSPARENT CIRCUIT BOARD.

4,136,379. PHOTOFLASH LAMP ARRAY HAVING REFLECTIVE CIRCUIT BOARD.

4,146,917. PHOTOFLASH LAMP ARRAY HAVING REFLECTIVE COATING MEANS.

4,166,287. PHOTOFLASH LAMP ARRAY.

4,167,773. PHOTOFLASH LAMP ARRAY HAVING CONTOURED SHEET SHIELD.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Virginia 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division,
Room 2D444, Pentagon, Washington, D.C. 20310

Patent application 6-003,699. Narcotic Antagonists in the Therapy of Shock. Filed Jan. 16, 1979.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6-042,471. Adjustable Connector. Filed May 25, 1979.

Patent application 6-043,984. Singly Rotated Cut of Y-Axis Boule Lead Potassium Niobate, $Pb_2KNb_5O_{15}$, for Surface Acoustic Wave Applications. Filed May 31, 1979.

Patent application 6-043,985. Lead Potassium Niobate Substrate Member for Surface Acoustic Wave Application. Filed May 31, 1979.

Patent application 6-046,898. Method for Synthesizing Fluorocarbon Halides. Filed June 8, 1979.

Patent application 6-047,558. The Synthesis of Fluorocarbon Esters. Filed June 9, 1979.

Patent application 6-048,322. Synthesis of Acetylene-Terminated Compounds. Filed June 14, 1979.

Patent 4,161,874. Head and Neck Impact Measurement System. Filed Aug. 8, 1978. Patented July 24, 1979. Not available NTIS.

Patent 4,162,203. Method of Making a Narrow-Band Inverted Homo-Heterojunction Avalanche Photodiode. Filed June 28, 1978. Patented July 24, 1979. Not available NTIS.

Patent 4,162,265. Aromatic Enyne Compounds and Their Synthesis. Filed Sept. 27, 1978. Patented July 24, 1979. Not available NTIS.

Patent 4,162,292. High Pressure Hydrazine Gas Generator. Filed Oct. 20, 1977. Patented July 24, 1979. Not available NTIS.

Patent 4,162,818. Interconnection for Planar Electronic Circuits. Filed Dec. 28, 1977. Patented July 31, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch
Administration Service Division, Federal Bldg.,
Science and Education Administration
Hyattsville, Md. 20782

Patent application 6-040,252. Insect Repellents. Filed Sept. 28, 1979.

Patent application 6-040,253. Insect Repellents. Filed Sept. 28, 1979.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents, Room A 2-3018
Washington, D.C. 20545

Patent 4,093,858. Cesium Injection System for Negative Ion Duoplasmatrons. Filed June 6, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,096,042. Electroplating Method and Apparatus. Filed Apr. 4, 1969. Patented June 20, 1978. Not available NTIS.

Patent 4,098,329. Modular Heat Exchanger. Filed July 29, 1976. Patented July 4, 1978. Not available NTIS.

Patent 4,098,408. Automatic Inspection System for Nuclear Fuel Pellets or Rods. Filed Apr. 22, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,099,961. Closed Cell Metal Foam Method. Filed Dec. 21, 1976. Patented July 11, 1978. Not available NTIS.

Patent 4,100,019. Nozzle Seal. Filed June 27, 1975. Patented July 11, 1978. Not available NTIS.

Patent 4,100,414. Method for Measuring Dose-Equivalent in a Neutron Flux With an Unknown Energy Spectra and Means for Carrying Out That Method. Filed Jan. 19, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,100,888. Vapor Generator Steam Drum Spray Heat. Filed Mar. 15, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,101,813. Double Deflection System for an Electron Beam Device. Filed Apr. 14, 1977. Patented July 18, 1978. Not available NTIS.

Patent 4,102,582. Examination of Interior Surfaces Using Glow-Discharge Illumination. Filed Nov. 9, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,104,499. Electric Arc Welding Gun. Filed Nov. 2, 1976. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,106,186. Boron Nitride Insulating Material. Filed Nov. 24, 1976. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,110,648. Homopolar Machine for Reversible Energy Storage and Transfer Systems. Filed June 10, 1975. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,112,568. Method of Fabricating a Flow Device. Filed June 1, 1977. Patented Sept. 12, 1978. Not available NTIS.

Patent 4,117,966. Explosive Welding of a Tube Into a Tube Sheet. Filed Oct. 13, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,449. Method of Making a Cellulose Acetate Low Density Microcellular Foam. Filed Dec. 9, 1976. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,123,949. Inertial Energy Storage Device. Filed Sept. 14, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,125,221. Temperature-Dependent Liquid Metal Flow-rate Control Device. Filed Sept. 7, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,125,431. Tandem Mirror Plasma Confinement Apparatus. Filed June 16, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,125,642. Method for Conducting Electroless Metal-Plating Processes. Filed Aug. 25, 1977. Patented Nov. 14, 1978. Not available NTIS.

Patent 4,127,238. Toroidal Core Winder. Filed June 6, 1977. Patented Nov. 28, 1978. Not available NTIS.

Patent 4,127,442. Charge Exchange Cooling in the Tandem Mirror Plasma Confinement Apparatus. Filed June 16, 1977. Patented Nov. 28, 1978. Not available NTIS.

Patent 4,128,473. Catalytic Hydrotreating Process. Filed Dec. 5, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,128,776. Magnetohydrodynamic Electrode. Filed Nov. 29, 1976. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,129,462. Gamma Prime Hardened Nickel-Iron Based Superalloy. Filed Apr. 7, 1977. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,129,463. Polycrystalline Silicon Semiconducting Material by Nuclear Transmutation Doping. Filed June 29, 1977. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,129,476. Environment Control System. Filed July 28, 1976. Patented Dec. 12, 1978. Not available NTIS.

Patent 4,130,422. Copper-Base Alloy for Liquid Phase Sintering of Ferrous Powders. Filed June 16, 1977. Patented Dec. 19, 1978. Not available NTIS.

Patent 4,130,500. Lithium-Aluminum-Magnesium Electrode Composition. Filed Dec. 14, 1977. Patented Dec. 19, 1978. Not available NTIS.

Patent 4,130,671. Method for Preparing a Thick Film Conductor. Filed Sept. 30, 1977. Patented Dec. 19, 1978. Not available NTIS.

Patent 4,132,639. Method for Improving the Sedimentation and Filterability of Coal-Derived Liquids. Filed Aug. 4, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,132,894. Monitor of the Concentration of Particles of Dense Radioactive Materials in a Stream of Air. Filed Apr. 4, 1978. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,134,290. Technique for Detecting Liquid Metal Leaks. Filed Sept. 6, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,134,563. Pipe Support. Filed Jan. 28, 1976. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,134,571. Double-Disc Gate Valve. Filed Nov. 3, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,093. Use of Predissociation to Enhance the Atomic Hydrogen Ion Fraction in Ion Sources. Filed Jan. 24, 1978. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,130. Method of Testing Gas Insulated Systems for the Presence of Conducting Particles Utilising a Gas Mixture of Nitrogen and Sulfur Hexafluoride. Filed June 29, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,294. Winding a Multi-Pancake Magnet From a Continuous Conductor. Filed Mar. 24, 1978. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,135,412. Backlash Compensator Mechanism. Filed Dec. 14, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,135,821. Calibration of Optical Particle-Size Analyzer. Filed Mar. 22, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,135,936. Glass-Ceramic Composition for Hermetic Seals. Filed June 16, 1978. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,136,926. Achromatic Illumination System for Small Targets. Filed Apr. 14, 1978. Patented Jan. 30, 1979. Not available NTIS.

Patent 4,137,423. Nuclear Instrumentation Cable End Seal. Filed Dec. 16, 1977. Patented Jan. 30, 1979. Not available NTIS.

Patent 4,138,317. Magnetic Confinement System Using Charged Ammonia Targets. Filed June 5, 1978. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,138,609. Method for Forming Electrically Charged Laser Targets. Filed June 22, 1976. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,140,557. High Strength and High Toughness Steel. Filed Jan. 23, 1978. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,931. Magnetohydrodynamic Generator Electrode. Filed Aug. 8, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,943. Plasma Generating Device With Hairpin Shaped Cathode Filaments. Filed June 1, 1977. Patented Feb. 20, 1979. Not available NTIS.

Patent 4,140,978. Method and Apparatus for Producing Laser Radiation Following Two-Photon Excitation of a Gaseous Medium. Filed Apr. 29, 1977. Patented Feb. 20, 1978. Not available NTIS.

Patent 4,141,150. Gage for Micromachining System. Filed Dec. 14, 1977. Patented Feb. 27, 1979. Not available NTIS.

U.S. ENVIRONMENTAL PROTECTION AGENCY
Room W513, 401 M St., SW., Washington, D.C. 20460

Patent application 826,052. Benthic Aquatic Biotal Monitor. Filed Aug. 19, 1977.

Patent 4,043,741. Burner Equipment and Operation Thereof. Filed Mar. 11, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,084,543. Aquatic Biotal Monitor. Filed Aug. 25, 1976. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,138,986. High Efficiency Furnace With Low Pollution Emissions. Filed Mar. 14, 1977. Patented Feb. 13, 1979. Not available NTIS.

Patent 4,155,313. Utilization of Solid Material Containing Combustible Matter. Filed July 15, 1977. Patented May 22, 1979. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6-031,970. Enhancement of Cholesterol-Combining Properties of Saponins. Filed Apr. 20, 1979.

Patent application 6-044,260. Ultrasensitive Enzymatic Radioimmunoassay Method. Filed May 31, 1979.

Patent application 6-045,052. Toroidal Coil Plant Centrifuge. Filed June 4, 1979.

Patent application 6-046,431. Depth-Sense Perception and Two-Point Discrimination Aesthesiometers. Filed May 7, 1979.

Patent application 6-046,826. Feedback Controlled Geometry Registration System for Radiographs. Filed June 8, 1979.

Patent application 6-047,786. Apparatus and Method for Determining Serum Concentrates of Metabolites by Monitoring Dialysate Fluid. Filed June 11, 1979.

Patent application 6-048,637. Process for the Fractionation of Cells. Filed June 14, 1979.

Patent application 6-050,100. Anti-Neoplastic Use of 1,4-Bis (Substituted Aminoalkyl Amino)-Anthraquinones. Filed June 19, 1979.

Patent application 6-050,330. Anti-Neoplastic Use of 1,4-Bis (Substituted Aminoalkyl Amino)-Anthraquinones. Filed June 20, 1979.

Patent application 6-052,110. Everting Tube Devices With Relative Advance Control. Filed June 26, 1979.

Patent application 6-052,728. Steroidal Cyclotriphosphazenes. Filed June 28, 1979.

Patent application 6-063,770. Methods for the Use of Orally Administered 13-Cis-Retinoic Acid for the Treatment of Dermatopathies. Filed Aug. 6, 1979.

Patent 4,162,761. Flow-Through Coil Planet Centrifuges With Adjustable Rotation/Revolution of Column. Filed Nov. 30, 1977. Patented July 31, 1979. Not available NTIS.

Patent 4,165,182. System for Obtaining Displacement-Amplitude Information From a Quadrature-Dual Interferometer. Filed Dec. 9, 1977. Patented Aug. 21, 1979. Not available NTIS.

Patent 4,167,633. Preparation of 2,4,5,6-Tetraaminopyrimidine From 2,4,6-Triaminopyrimidine. Filed July 20, 1977. Patented Sept. 11, 1979. Not available NTIS.

Patent 4,169,011. Facile Synthesis of 3'-Phosphoadenosine 5'-Phosphosulfate (PAPS). Filed Oct. 11, 1977. Patented Sept. 25, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent application 6–029,953. Leaching Gold-Silver Ores. Filed Apr. 13, 1979.

Patent 4,043,946. Production of Supported Raney Nickel Catalysts by Reactive Diffusion. Filed July 30, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,044,115. Production of Alumina Monohydrate From Aluminum Nitrate Solutions. Filed July 2, 1976. Patented Aug. 23, 1977. Not available NTIS.

Patent 4,051,681. Unitary Roof Bolt Assembly. Filed Oct. 6, 1975. Patented Oct. 4, 1977. Not available NTIS.

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OFFICE OF NAVAL RESEARCH

Field Support Group, Room 221, Arlington, Va. 22217

Patent 4,158,151. Semiconductor Laser Modulating Circuit. Filed July 1, 1977. Patented June 12, 1979. Not available NTIS.

Patent 4,161,783. Charge-Coupled Multiplying Digital-to-Analog Converter. Filed Apr. 3, 1978. Patented July 17, 1979. Not available NTIS.

Patent 4,162,497. Side Lobe Suppression Device for a Directional Receiving System. Filed Sept. 18, 1963. Patented July 24, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–4, Washington, D.C. 20546

Patent application 6–051,275. Solar Engine. Filed June 22, 1979.

Patent application 6–057,466. Method and Apparatus for Shaping and Enhancing Acoustical Levitation Forces. Filed July 13, 1979.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
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	St. Louis Public Library	(314) 241-2288 Ext. 214
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 26, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-14-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-3-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-16-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-29-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-13-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	12-14-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-8-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	8-22-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	8-17-78

Expiration of patents: The patents within the range of numbers indicated below expire during January 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,070,801 to 3,076,194, inclusive
Plant Patents ..... Numbers 2,208 to 2,223, inclusive

REISSUES

MARCH 11, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,224

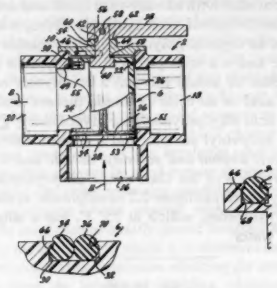
VALVE CONSTRUCTION

Robert Ortega, Fountain Valley, Calif., assignor to Purex Corporation, Lakewood, Calif.

Original No. 3,938,553, dated Feb. 17, 1976, Ser. No. 413,841, Nov. 8, 1973. Application for reissue Feb. 2, 1978, Ser. No. 874,575

Int. Cl.[2] F16K *11/085*

U.S. Cl. 137—625.47 **16 Claims**



7. A valve comprising

(a) a valve body having a cavity, and first, second and third flow openings,

(b) a valve member rotatably positioned within said cavity, said valve member having a generally cylindrical hollow configuration with an end opening in alignment with the body first opening,

(c) the valve member having a side opening characterized in that the side opening is openly aligned with only the second body opening when the valve member is in a primary position whereby flow communication is provided between said first and second openings, and the side opening is openly aligned with only the third body opening when the valve member is rotated about 180° to a secondary position, whereby flow communication is then provided between said first and third openings,

(d) the side opening further characterized in that it becomes openly aligned with both the second and third body openings when the valve member is rotated intermediately of said primary and secondary positions,

(e) the valve member having an outer surface substantially the entirety of which is everywhere cylindrical about one axis defined as an axis of rotation of said valve member in said body, the second and third flow openings being substantially coaxial,

(f) and seal means sealing off between the body and valve member characterized in that a seal is established about the side opening and second opening in said primary position, and a seal is established about the side opening and third opening in said secondary position,

(g) the seal means located between the body and valve means and including two annular sealing surfaces extending about an axis defined by the cylindrical valve member, and two straight sealing surfaces intersecting the two annular sealing surfaces at opposite sides of said axis, said side opening in said member being cylindrically arcuate about said axis and extending into proximity to said two straight sealing surfaces.

Re. 30,225

METHOD AND APPARATUS FOR FEEDING GRANULATED MATERIAL

John H. Simmons, Lyndhurst, and Donald A. Daugherty, Euclid, both of Ohio, assignors to Precision Metalsmiths, Inc., Cleveland, Ohio

Original No. 4,016,922, dated Apr. 12, 1977, Ser. No. 672,524, Mar. 31, 1976. Application for reissue Mar. 6, 1978, Ser. No. 884,264

Int. Cl.[2] B29F *1/06*

U.S. Cl. 164—45 **9 Claims**

1. In [an] *apparatus for* injection [apparatus] *molding thermoplastic material* having a pair of relatively movable dies, [means including] a pressurized heated tank for supplying molten *thermoplastic* injection material to the dies, [and] means for causing relative movement of the dies between open and closed positions, *and injection means for transferring molten thermoplastic material from the tank to the dies when in closed position* the improvement [of a feeder for periodically supplying charges of solid granules of injection material to said tank, said feeder] comprising:

a. [A] *a* housing having an inlet port [and] *adapted to be connected to a supply of granular thermoplastic material,* an outlet port [communicating] *adapted to be connected* with [said] *the* tank, *and a pressure port spaced from said outlet port;*

b. *transfer* means [containing a supply of granules communicating with said inlet port] *in said housing;*

c. *said* transfer means [including a metering chamber] *being* movable [in said housing] between:

(i) a first position in which said [chamber receives a quantity of granules] *transfer means can receive granular thermoplastic material* admitted through said inlet port; and

(ii) a second position in which said [chamber discharges a charge of granules] *transfer means can discharge granular thermoplastic material* through said outlet port *into the tank;*

d. means for actuating said transfer means, and

e. [means for pressurizing] *said pressure port communicating with said outlet port when said transfer means is in said first and second positions* via said [metering chamber to fluidize the granules of injection material contained therein when said transfer means is in said second position] *transfer means, whereby discharge of granular thermoplastic material from the transfer means can be assisted by pressurized gas and pressurized gas is trapped in said transfer means and*

released through said inlet port when said transfer means is moved to said first position to assist the flow of granular thermoplastic material into said transfer means and whereby the tank is pressurized with gas admitted thereto through said outlet port.

Re. 30,226

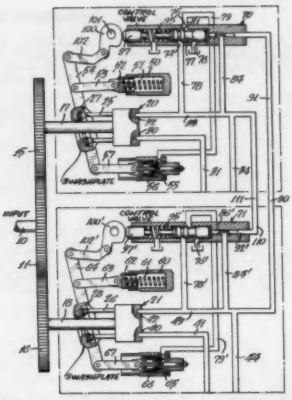
TORQUE LIMITING CONTROL

Joseph E. Louis, Ames, and Roger D. Cannell, Nevada, both of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Original No. 3,941,514, dated Mar. 2, 1976, Ser. No. 471,573, May 20, 1974. Application for reissue Jul. 11, 1977, Ser. No. 814,798

Int. Cl.[2] F04B *49/00*

U.S. Cl. 417—216 **3 Claims**



8. A torque limiting control for a pair of variable displacement axial piston pumps each having a swashplate for controlling the stroke of the associated pump pistons, each of said pumps having a fluid inlet and a fluid pressure outlet for connection of said outlets to separate motors, servo means for positioning each of said swashplates including means urging said swashplates to a full stroke position and pressure-responsive means to position said swashplates at a position other than full stroke, and control means for summing the fluid pressures generated by said pumps and controlling said servo means to progressively move the swashplates from their full stroke positions as the sum of the pressures rises above a predetermined value to limit the sum of the torques delivered by said pumps including a pair of control valves *associated one with each of said pair of pumps and* with each control valve having a pressure port connected to the outlet of [an] *the* associated pump, each control valve having a housing with a bore, said pressure port, a drain port and a servo port communicating with said bore, a valve member in said bore, [urged] *spring means engaging the valve member for urging the valve member* to a position to connect said servo port with the drain port, a pair of pressure-responsive areas [associated with] *in coaxial relation with* said valve member *and said spring means* for said summing of the fluid pressures generated by both of said pumps to move the valve member *against the spring means* in a direction to close said drain port and open the servo port to said pressure port, [and] means connecting the servo port to said servo means whereby outlet pressure of a pump is applied to the servo means of the same pump for positioning the swashplate *, and a pair of feedback means associated one with each pump and control valve including a cam and cam follower with the cam positioned responsive to swashplate position and the cam follower acting in coaxial relation with the valve member and the spring means to modify the controlling action of the valve member.*

Re. 30,227

AGENT FOR BRIGHTENING AND REMOVING GREYNESS FROM TEXTILES

Richard von Rutte, Riehen, and Walter Gasser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Original No. 4,008,172, dated Feb. 15, 1977, Ser. No. 519,890, Oct. 31, 1974. Application for reissue Apr. 7, 1978, Ser. No. 894,262

Claims priority, application Switzerland, Nov. 29, 1973, 16761/73

Int. Cl.[2] C09K *11/00*; D06L *3/12*

U.S. Cl. 252—301.22 **9 Claims**

1. Agent for the preparation of the baths for brightening the colour of and removing the greyness from white and pastel coloured textiles which are made from synthetic fibres or which are provided with an easy-care finish and are made from cotton or blends thereof with synthetic fibres, which consists essentially of an organic polymer which is soluble or emulsifiable in water and is a homopolymer of acrylic or methacrylic acid or an ester or amide thereof, a copolymer of acrylic or methacrylic acid or an ester or amide thereof with acrylic or methacrylic acid alkylpolyalkylene glycol ester, [a polyvinyl alcohol or a polyvinyl acetate, and a mixture thereof] *a mixture of polyvinyl alcohol and polyvinyl acetate* and a fluorescent brightener which is of the class of the distyrylbiphenyls, [the bis-(s-triazinylamino)-stilbene-2,2'-disulphonic acids] or of the bis-(triazolyl)-stilbenes, which at 25° C. **has a solubility of at least** 0.5 g/l water.

Re. 30,228

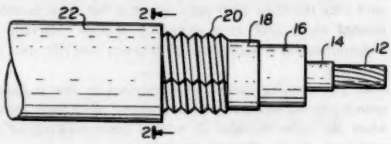
POWER CABLE WITH CORRUGATED OR SMOOTH LONGITUDINALLY FOLDED METALLIC SHIELDING TAPE

David A. Silver, Livingston, and George Bahder, Edison, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Original No. 3,651,244, dated Mar. 21, 1972, Ser. No. 866,586, Oct. 15, 1969. Continuation of Ser. No. 640,092, Dec. 12, 1975, abandoned, which is a continuation of Ser. No. 335,259, Feb. 23, 1973, abandoned. Application for reissue Sep. 28, 1977, Ser. No. 837,187

Int. Cl.[2] H01B *9/02*

U.S. Cl. 174—36 **23 Claims**



1. In a high voltage electrostatically shielded power cable including a metal conductor, a semi-conducting shield around the conductor, electrical insulation around the shield, a semi-conducting insulation shielding around the outside of the insulation and a metallic electrostatic shield over the semi-conducting insulation shielding, the improvement which comprises the metallic shield being a longitudinally folded strip of metal which provides a low resistance, low reactance path, for voltage and current surges caused by lightning or switching or fault currents, lengthwise of the cables, the electrostatic shield being made of corrosive metal and having corrosion-protecting coating on both sides; the electrostatic shield having its longitudinal edge portions free to move circumferentially with respect to one another and the electrostatic shield having its inside surface in contact with the insulation shielding and free throughout its length and circumference to move circumferentially over the insulation shielding with which the electrostatic shield contacts as the diameter and circumference of the elec-

trostatic shield change with thermal expansion and contraction of the insulation and the insulation shield as the cable changes its temperature during normal, emergency and short-circuiting operating conditions whereby the insulation and insulation shield expand without axially spaced localized distortion, and said metal of the electrostatic shield being in electrical communication with the semi-conducting insulation shielding through the coating on the inside surface of said electrostatic shield for accepting charging current from the insulation shielding.

13. In a high voltage electrostatically shielded power cable including a metal conductor, a semi-conducting shield around the conductor, electrical insulation around the shield, a semi-conducting insulation shielding around the outside of the insulation and a metallic electrostatic shield over the semi-conducting insulation shielding, the improvement which comprises the metallic shield being a longitudinally folded and corrugated strip of metal which provides a low resistance, low reactance path, for voltage and current surges caused by lightning or switching or fault currents, lengthwise of the cable, the electrostatic shield having its longitudinal edge portions free to move circumferentially with respect to one another and the electrostatic shield having its inside surface in contact with the insulation shielding and free throughout its length and circumference to move circumferentially over the insulation shield with which the electrostatic shield contacts as the diameter and circumference of the electrostatic shield change with thermal expansion and contraction of the insulation and the insulation shield as the cable changes its temperature during normal, emergency and short-circuiting operating conditions whereby the insulation and insulation shield expand without constricting and damaging the insulation at axially spaced localized distortion, and said metal of the electrostatic shield is in electrical communication with the semi-conducting insulation shielding for accepting charging current from the insulation shielding, characterized by the electrostatic shield being corrugated with the corrugations extending in a generally circumferential direction and with most of the downwardly extending humps of the corrugations having contact with the insulation shielding, and semi-conducting material filling the spaces between the insulation shielding and the upwardly extending humps of the corrugations for establishing electrical communication between the face of the electrostatic shield that confronts the insulation shielding and for preventing passage of moist air and water longitudinally of the cable between the insulation layer and the electrostatic shield.

Re. 30,229

MODULAR OPERATING CENTERS AND METHODS OF BUILDING SAME FOR USE IN ELECTRIC POWER GENERATING PLANTS AND OTHER INDUSTRIAL AND COMMERCIAL PLANTS, PROCESSES AND SYSTEMS

Paul A. Berman, Plymouth Meeting; Theodore C. Giras, Pittsburgh; Roy E. Crews, Allison Park, all of Pa., and Robert L. Ziegelman, 29228 Summerwood, Farmington, Mich. 48018, assignors to Robert L. Ziegelman, Farmington, Mich.

Original No. 3,925,679, dated Dec. 9, 1975, Ser. No. 399,582, Sep. 21, 1973. Application for reissue Sep. 22, 1977, Ser. No. 835,561

Int. Cl.[2] B05D *5/00*

U.S. Cl. 290—1 R **16 Claims**

37. A method of building an operating center for a plant designed to produce goods or services, the steps of said method comprising:

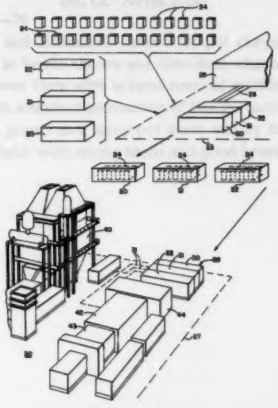
forming a plurality of building modules, each as a transportable, room-size, three-dimensional, rectangular, metal frame structure;

securing permanent closure means to and closing the roof and floor on some but not all of the sides of the frame structure, any side not so closed being one that will abut another module and forming a complete operating center building;

loading each of said modules with predetermined electrical control system equipment units at a factory site, such building modules constituting structural parts of a unitary operating center building and such control system equipment units constituting parts of a system for use in monitoring and/or controlling the operation of the production plant;

establishing at the factory site predetermined intramodule connections among the control equipment units within each building modules;

establishing at the factory site predetermined intermodule connections among the control system equipment units in different ones of the building modules;



establishing at the factory site predetermined connections to the control system equipment units for ultimate attachment from one or more of the modules to the production plant at predetermined plant points;

employing a plurality of conductors to establish the intramodule connections;

employing a plurality of cables having a plurality of conductors to establish the intermodule and plant connections through cable connection points;

testing the control system equipment at the factory site, such test including the combined testing of the control system equipment interconnected by the intermodule cable connections;

preparing the loaded building modules for transportation to the plant installation site including disconnecting the intermodule and any test connections at the cable connection points;

transporting the modules to the plant site;

and installing the modules and establishing the cable connections from the modules to the plant points and re-establishing the intermodules cable connection.

PLANT PATENTS

GRANTED MARCH 11, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,509

CHRYSANTHEMUM NAMED GETTYSBURG

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Oct. 26, 1978, Ser. No. 955,003

Int. Cl.[2] A01H 5/00

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive cultivar of pot chrysanthemum, substantially as herein shown and described, characterized by its single flower form having intense yellow ray florets possessing good substance and long life, its minimal production of pollen, its abundant production of blooms when grown as a spray pot plant, and its spreading pot habit with good breaking ability.

4,510

CHRYSANTHEMUM NAMED ANTHEM

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Oct. 26, 1978, Ser. No. 955,147

Int. Cl.[2] A01H 5/00

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive cultivar of pot chrysanthemum, substantially as herein shown and described, characterized by its single flower form with several rows of medium pink ray florets, and its abundant production of blooms having minimal pollen when grown as a spray pot plant, and by its relatively upright pot habit with strong stems and good breaking ability.

PATENTS

GRANTED MAR. 11, 1980

ERRATA

For CLASS	See PATENT NO.
433–003	4,192,068
433–021	4,192,069
433–011	4,192,070
433–093	4,192,071
368–155	4,192,130
368–157	4,192,131
368–160	4,192,132
368–073	4,192,133
368–080	4,192,134
368–062	4,192,135
368–222	4,192,136
126–286	4,192,310
188–170	4,192,405
371–020	4,192,451
126–427	4,192,454
430–059	4,192,677
430–214	4,192,678
430–214	4,192,679
430–380	4,192,680
430–373	4,192,681
430–405	4,192,682
430–536	4,192,683
430–284	4,192,684
430–283	4,192,685
430–455	4,192,764
525–243	4,192,797
548–177	4,192,804
585–409	4,192,824
585–719	4,192,825
525–123	4,192,827
525–083	4,192,828
260–597 R	4,192,942
370–053	4,192,973
375–002	4,193,030
455–038	4,193,031
178–116	4,193,032
375–088	4,193,033
375–088	4,193,034
455–203	4,193,035
455–327	4,193,036
367–094	4,193,055
367–153	4,193,057
367–071	4,193,058
371–067	4,193,061
371–043	4,193,062

PATENTS

GRANTED MAR. 11, 1980

ERRATA

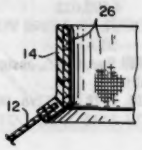
No	No
[illegible]	PATENT NO.
[illegible]	[illegible]

PATENTS

GRANTED MARCH 11, 1980

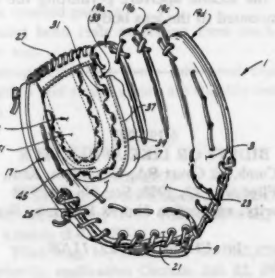
GENERAL AND MECHANICAL

4,192,017
VISORED HEADGEAR
William L. Fay, Wellesley Hills, Mass., assignor to Visor-Trac, Inc., Rockville Center, N.Y.
Filed Mar. 6, 1978, Ser. No. 883,874
Int. Cl.[2] A42B *1/00, 1/24*
U.S. Cl. 2—12 **1 Claim**



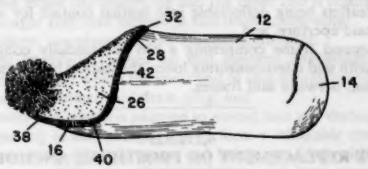
1. Headgear comprising a headband and a visor, said headband comprising an elongate, flexible strip of extruded plastic embodying a head-encircling portion and a visor-retaining portion disposed at an oblique angle to the head-encircling portion containing an integrally formed slot for receiving an edge of the visor, means at the opposite ends of the head-encircling portion for securing the band about the head comprising a part connected at one end to one end of the head-encircling portion containing a plurality of uniformly-spaced perforations and a part connected at one end to the other end of the head-encircling portion containing uniformly-spaced nubs adapted to be frictionally engaged with the perforations in the one part and said visor comprises a crescent-shaped part having a concave edge disposed in the slot and secured therein, said visor being transparent, a logo disposed in engagement with the visor so that it is visible through the visor at the top side thereof and a part secured to the visor over the logo to retain the latter in place.

4,192,018
BASEBALL GLOVE
Roland N. Latina, Belleville, Ill., assignor to A-T-O Inc., Willoughby, Ohio
Filed Apr. 14, 1978, Ser. No. 896,293
Int. Cl.[2] A41D *13/10*
U.S. Cl. 2—19 **6 Claims**



1. A baseball glove or the like having a thumb stall, a finger stall spaced from the thumb stall, a crotch portion between the thumb and finger stalls, a front ply constituting the front face of the glove, a back ply constituting the back face of the glove, the front and back plies being joined together by a seam extending along the inner margins of the thumb and finger stalls and the margin of the crotch portion, and a web secured to and extending between said thumb and finger stalls, said web having a plurality of spaced tunnels at its margins contiguous to the inner margins of the thumb and finger stalls and the margin of the crotch portion, the finger and thumb stalls and said crotch portion having a plurality of spaced glove tunnels extending toward the web from the inner margins of the thumb and said finger stalls and the margin of the crotch portion, said glove tunnels and said web tunnels alternating with one another and being generally in line with one another, the glove further comprising a lace passing through the glove and the web tunnels for securing said web thereto, a strip having a series of holes therethrough substantially centered on the central longitudinal axis of the strip and substantially equidistant from one another along the length of the strip with substantially equal portions of the strip between said holes, the strip being folded double on said longitudinal axis and having its overlapped faces secured to said front and back plies along seam joining the front and back plies so that the folded edge of the strip projects inwardly toward the web with the double-folded portions of the strip between the holes therein constituting said glove tunnels, and said web comprising an inner web member and a separate generally U-shaped peripheral member having an inner margin attached to the inner web member along the outer margin of the inner web member, and an outer margin adjacent said inner margins of said finger and thumb stalls and the margin of said crotch portion, the outer margin of the peripheral member having a first series of holes therein spaced substantially equidistantly from one another along a first generally curvilinear line with substantially equal portions of said peripheral member between each of said holes, the outer margin of the peripheral member being folded double on said first curvilinear line and having said double-folded portions secured together whereby said portions of said peripheral member between said first series of holes constitute said web tunnels.

4,192,019
MINI-SOCK
Ralph E. Lingenfelter, Friendsville, Tenn., assignor to Holston Manufacturing Company, Knoxville, Tenn.
Filed Apr. 28, 1978, Ser. No. 900,989
Int. Cl.[2] A41B *11/00*
U.S. Cl. 2—239 **5 Claims**



1. In a sock having a body section, a closed toe section, a closed heel section, and means defining an opening for receiving the foot of a wearer, said sock covering substantially the entire foot of a wearer, the improvement comprising an ankle portion having removed therefrom a segment of said sock extending from the approximate location of the wearer's instep in a direction toward said defined opening, said ankle portion defining a continuous flap circumscribing at least a major portion of said defined opening and, when disposed on a wearer's foot, being backfolded over said heel section by a distance sufficient to cause said flap to overlie at least a major portion of said heel, said flap including a distal perimetral edge which, when the sock is in position on the foot of a wearer and a shoe is also in position on the foot of the wearer with the sock being disposed between said foot and said shoe, lies in a continuous

line extending from the approximate location of the wearer's instep in a downwardly and rearwardly direction generally parallel with and adjacent to the sole of said shoe, thence in a direction wrapping the most rearward portion of the heel of said shoe to a location on the opposite side of the shoe, thence in a direction on said opposite side of said shoe forwardly of said shoe and generally parallel with and adjacent to the sole of said shoe, thence in an upwardly and forwardly direction of the aforesaid approximate location of the wearer's instep.

4,192,020

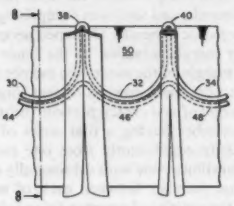
HEART VALVE PROSTHESIS

Robert B. Davis, Framingham; John Skelton, Sharon, both of Mass.; Richard E. Clark, and Wilbur M. Swanson, both of St. Louis, Mo., assignors to Washington University and Albany International Corporation

Continuation-in-part of Ser. No. 771,359, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 575,438, May 7, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,442

Int. Cl.[2] A61F *1/22*

U.S. Cl. 3—1.5 **14 Claims**



8. A heart valve prosthesis comprising in combination,

a frame having three mutually equidistant, generally parallel legs each comprising a pair of rod portions connected at one end and diverging at the other end as lobes respectively connecting with rod portions of the other legs, the lobes forming an aperture therebetween,

three flexible fabric leaflets each consisting essentially of a textile of filaments having a substantial number of open interstitial spaces in the range of 20 to 40 microns evenly distributed throughout the fabric, each leaflet being inserted between the rod portions of two of said legs, sealed to said legs and the interconnecting lobe and having a free edge extending between said legs, the free edges of said leaflets being deflectable into mutual contact for sealing said aperture, and

a second frame comprising a rod substantially congruent with said interconnecting lobes, the leaflets being sealed to and between said frames.

4,192,021

BONE REPLACEMENT OR PROSTHESIS ANCHORING MATERIAL

Heinrich Deibig, Frankfurt am Main; Helmut Heide, Schwalbach; Roland Reiner, Eschborn, and Kari Koster, Lorsbach, all of Fed. Rep. of Germany, assignors to Batelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed May 12, 1977, Ser. No. 796,165

Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2620890; May 12, 1976, 2620891

Int. Cl.[2] A61F *1/24; C08H 1/06*

U.S. Cl. 3—1.9 **15 Claims**

1. Bone replacement of prosthesis anchoring material on the basis of calcium phosphates and organic materials characterized in that said material consists of a mixture of sintered calcium phosphates composed of CaO and P_2O_5 in a quantitive ratio between 2:1 and 4:1 with at least one low-molecular-weight biodegradable or bioresistant organic material, which has a molecular weight of up to 800, or at least one high-molecular-weight biodegradable or bioresistant organic material or a mixture thereof and wherein it is implantable as a solid body or as a kneadable pasty substance, whereby the quantitive ratio of the calcium phosphate to the organic materials is between 10:1 and 1:1 for a solid body and is between 5:1 and 1:1 for a pasty substance.

4,192,022

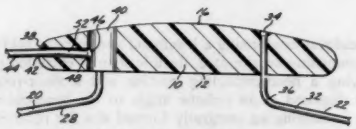
ARTIFICIAL INTRAOCULAR LENS WITH IMPROVED STAVE

Peter G. LaHaye, Diamond Bar, Calif., assignor to Iolab Corporation, San Dimas, Calif.

Filed Apr. 28, 1978, Ser. No. 901,127

Int. Cl.[2] A61F *1/16, 1/24*

U.S. Cl. 3—13 **17 Claims**



1. An artificial anterior chamber intraocular lens having a longitudinal axis, the lens comprising:

an optical zone lens body for refracting light;

at least one loop fixedly mounted to the intraocular lens, a portion of the loop capable of being inserted behind an iris into a posterior chamber of an eye, and

at least one stave having two ends, a first end being fixedly mounted to the intraocular lens, within a substantially horizontally disposed first aperture in the lens body, the stave having a substantially straight portion immediately adjacent to a second end, the second end bearing an enlarged head configured to project in a direction away from the loop and to define a keeper member on one side and a substantially continuous camming surface at the other side contiguous with an intermediate portion of the stave, the stave capable of being positioned so that the keeper member on the second end of the stave enters the loop and secures it wherein the lens body includes a substantially vertically disposed second aperture, the first and second apertures being disposed to communicate with one another, the second aperture permitting the stave to be fixedly mounted to the lens body.

4,192,023

BIDETS OR LIKE APPARATUS

Barry P. McComb, 62 Court Rd., Orpington, Kent, England

Filed Sep. 12, 1978, Ser. No. 941,710

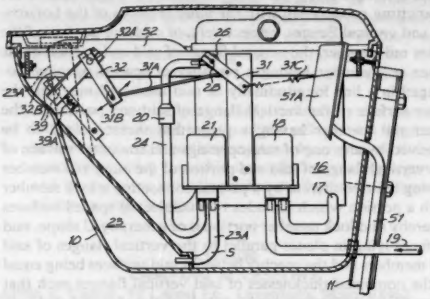
Claims priority, application United Kingdom, Sep. 15, 1977, 38518/77

Int. Cl.[2] A47K *3/22, 11/08*

U.S. Cl. 4—7 **6 Claims**

1. A bidet or like apparatus having a casing (10), a water container (16) in the casing, a pipe (28) having a horizontal part leading from the upper part of the container to the outside of the casing, said pipe also having a depending part (28A) at the outer end of the horizontal part, said depending part being adapted to extend downwardly into a lavatory pan, said depending part having a rearwardly extending part (28B) at its lower end, said rearwardly extending part having a nozzle, whereby in an out-of-use position the nozzle will be under-

neath and close to the rim of said pan whereby the nozzle is subjected to the flushing water and means for rotating said pipe about the axis of the horizontal part to bring the nozzle to a raised position about central of said pan.



4,192,024

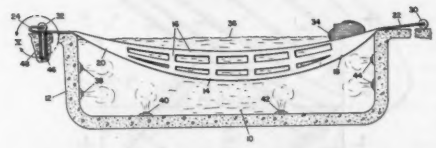
SPA LOUNGE

Clifford V. Zigmont, 18642 Community St., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 646,149, Jan. 2, 1976, abandoned. This application Oct. 26, 1978, Ser. No. 954,994

Int. Cl.[2] E04H *3/16, 3/18*

U.S. Cl. 4—172 **7 Claims**



1. A combination of a hot water spa and a lounge mounted therein; said spa having a deck surrounding said spa, said deck having sleeves fitted therein at opposite ends of said spa; said lounge being formed of one piece and comprising

a body support portion formed of a series of unitary, narrow longitudinal and transverse strips of water resistant material in a crossed pattern,

unitary solid head rests extending from each end of said pattern, and

unitary straps extending from said head rests; and bolts attached to said straps which are slidably received in said sleeves.

4,192,025

COVER FOR SWIMMING POOL

Cornelius A. Hinsperger, 1749 Mattawa Ave., Mississauga, Ontario, Canada (L4X 1K5)

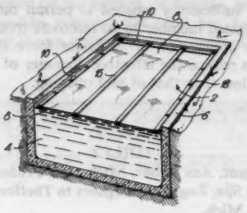
Filed Aug. 14, 1978, Ser. No. 933,679

Claims priority, application Canada, Jul. 12, 1978, 307263

Int. Cl.[2] E04H *3/16, 3/18*

U.S. Cl. 4—172.14 **24 Claims**

10. A lightweight thermal cover for a swimming pool which is completely foldable for storage comprising panels of thin and flexible plastic sheeting secured together in edgewise relationship by thin flexible strips of plastic sheet material, said strips being provided on both sides of said panels and overlapping edges of adjacent ones of said panels with sides of said strips facing said panels having a thin and flexible layer of closed cell foam material provided thereon, and additional flexible strips of plastic sheet material being secured around peripheral edges of the cover on both sides thereof, said strips



and said additional strips providing reinforcement and flotation.

4,192,026

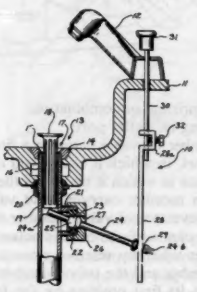
DRAIN VALVE BALL LEVER

Frank N. Williams, Sandwich, Ill., assignor to Bradley Corporation, Menomonee Falls, Wis.

Filed Nov. 13, 1978, Ser. No. 960,400

Int. Cl.[2] E03C *1/22*

U.S. Cl. 4—203 **3 Claims**



1. An improved ball lever for a pop-up drain valve assembly of the type in which an inner end of the ball lever is used to raise and lower the drain plug and the outer end is connected to a plunger rod, said improved ball lever comprising:

a unitary, one-piece, plastic, elongated member;

a ball integrally formed on said member intermediate its length upon which the inner end of said member pivots to raise and lower said drain plug; and

an outer end which is adapted to extend into and through an opening in said plunger rod to form a releasable connection therewith, said outer end being provided with stop means which prevents said plunger rod from travelling along and binding on said elongated member and retaining means for releasably securing the outer end of said member in the opening in said plunger rod which is spaced from said stop means to provide a plunger rod-receiving groove, said retaining means comprising:

at least two outwardly extending, spaced apart, resilient fingers formed in the outer end of said elongated member; and

an integral protuberance on each of said fingers having a combined non-deformed diameter which is greater than the diameter of the opening in said plunger rod but which is less than the diameter of the opening in said rod when said fingers are deformed by forcing them towards each other,

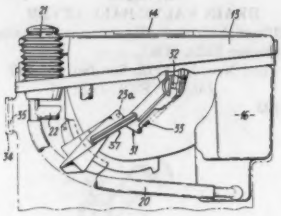
each of said protuberances including an outward inclination which facilitates the insertion of the outer end of said elongated member into the opening in said plunger rod,

and an inward inclination which prevents said outer end from sliding out of the opening in said plunger rod when said outer end is inserted into the opening in said rod, but which is sufficiently tapered to permit the outer end of said elongated member to be removed from said opening upon the application of sufficient force to deform said fingers to reduce the effective diameter of said protuberances to less than that of said opening.

4,192,027
TOILET

Frank T. Sargent, Ann Arbor, Mich., and Frederick A. Butler, Leamington Spa, England, assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Jul. 21, 1978, Ser. No. 926,932
Claims priority, application United Kingdom, Jul. 25, 1977, 31164/77
Int. Cl.[2] E03D *11/10*
U.S. Cl. 4—441 **10 Claims**

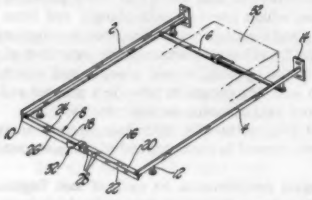


1. A toilet comprising, in combination:
(a) a bowl having an outlet port;
(b) a valve member movable between a first position under said outlet port, in which it closes said outlet port, and a second position in which it uncovers the outlet port;
(c) an actuation member carrying said valve member and movable relative to said valve member and
(d) cooperating cam surfaces on said actuation member and valve member whereby relative movement between the actuation member and the valve member, when the latter is moved into its first position by the former, urges the valve member in an upward direction to seal the outlet port.

4,192,028
ADJUSTABLE BED FRAME

Silas J. Knoke, Seymour, Ind., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 17, 1978, Ser. No. 934,306
Int. Cl.[2] A47C *19/04*
U.S. Cl. 5—181 **6 Claims**

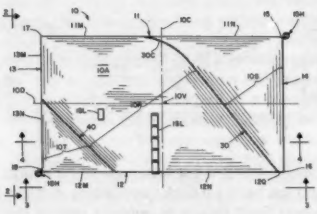


1. A bed frame adapted to receive bedding thereon and comprising a pair of spaced, parallel side rails and a pair of spaced end rails extending transversely to and having their ends connected to said side rails, each of said end rails including an inner rail member and an outer rail member each of which has horizontal and vertical flanges each having inner and outer surfaces, an end portion of said inner rail member being in nested relationship with an end portion of said outer rail member whereby the outer surfaces of the horizontal and vertical flanges of said end portion of the inner rail member are in abutting relationship with the inner surfaces of the horizontal and vertical flanges, respectively, of said end portion of the outer rail member, the vertical flange of said end portion of the inner rail member having a plurality of spaced openings arranged in a line longitudinally of said inner rail member, the inner surface of the vertical flange of said end portion of the outer rail member having a projection thereon sized to be received by any one of said openings and the outer surface of the vertical flange of said end portion of the outer rail member having secured thereto by a pivotal connection a lock member with a portion which includes two connected spaced surfaces whereby said lock member portion is of generally U shape, said surfaces lying in planes parallel to the vertical flanges of said rail members and the spacing between said surfaces being equal to the combined thicknesses of said vertical flanges such that when said rail members are in nested relationship and said lock member is in one rotated position, said lock member portion straddles said vertical flanges to maintain said rail members in the nested relationship.

4,192,029
HEAD AND NECK SUPPORTIVE DEVICE FOR HEMISIDE RECLINING PERSONS

Helen I. Bond, 19416 NE. 122nd Ave., Battleground, Wash. 98604

Filed Oct. 16, 1978, Ser. No. 951,445
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—441 **13 Claims**



1. A head supportive device for hemiside reclining persons and comprising a pillow having hingedly associated independent cushiony segments, said head supportive device comprising:

A. said pillow having a pair of broad external surfaces including a first-surface and a second-surface, having a pair of longitudinally extending edges including a top-edge and a bottom-edge, and having a pair of transversely extending edges including a front-edge and a rear-edge which are shorter than the longitudinal edges; and

B. bi-directional hinged connections for the pillow segments including a first-hinge and a second-hinge, the first-hinge being substantially lengthier than the second-hinge and each hinged connection being no-parallel to: the rear-edge, the front-edge, the top-edge, and the bottom-edge, said two hinged connections delineating the pillow into a primary-segment located medially of and oppositely flanked by a secondary-segment and a tertiary-segment, said cushiony segments being described as:

i. a primary-segment defined by the first-hinge, the second-hinge, and substantial proportions of the pillow top-edge and bottom-edge thereby peripherally defining a headrest-segment that in plan view provides the major proportion of the pillow overall plan view area:

ii. a secondary-segment peripherally defined by the first-

hinge, the pillow rear-edge and its tip-rear corner, and a substantial portion of the pillow top-edge, said secondary-segment at the pillow top-rear corner by virtue of said bi-directional first-hinge being locatable at arbitrarily selected positions beneath the primary-segment, whereby when the person's head is resting upon the primary-segment and anteriorly facing the second-hinge the first-hinge is inclined upwardly and rearwardly from the pillow top-edge; and

iii. a tertiary-segment peripherally defined by the second-hinge and substantial lengths of the pillow front-edge and bottom-edge, said tertiary-segment by virtue of the second-hinge being locatable beneath the primary-segment and in plan view providing substantially less than the area of the secondary-segment.

4,192,030

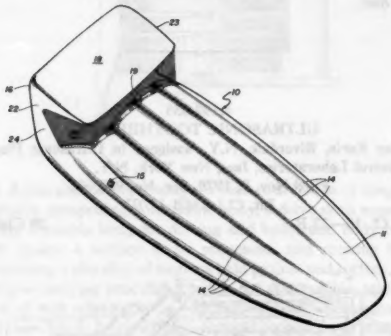
CAMPING ACCESSORY

Alwin E. Casson, 92 Laurel La., Lunenburg, Mass. 01462

Filed May 26, 1978, Ser. No. 909,823

Int. Cl.[2] A47G *9/00*

U.S. Cl. 5—420 **9 Claims**



1. Camping accessory, comprising:

(a) an elongated outer envelope formed of substantially waterproof and air impermeable sheet material with a continuous edge at one end,

(b) an elongated inner envelope formed of substantially air impermeable sheet material and lying within the outer envelope, said inner envelope having a continuous edge joined to the continuous edge of said outer envelope to form an airtight enclosure between the outer and inner envelopes, an inner space within said inner envelope and an opening to said inner space at said one end, and

(c) a valve for inflating the enclosure with air at superatmospheric pressure.

4,192,031

WATERBED MATTRESS

Isaac Fogel, Silver Spring, Md., assignor to Classic Corporation, Jessup, Md.

Filed Jan. 16, 1979, Ser. No. 3,820

Int. Cl.[2] A47B *27/08, 27/14*

U.S. Cl. 5—451 **5 Claims**

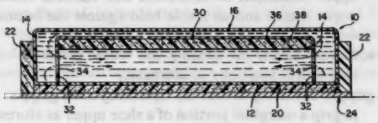
1. A waterbed mattress having dampening means for substantially eliminating water wave action comprising:

a. a top sheet, a bottom sheet, and peripheral vertical walls wherein the top sheet and the bottom sheet are joined to the peripheral vertical walls on their peripheral edges to form a sealed envelope; and

b. dampening means in the waterbed mattress, the dampening means being affixed to the interior surface of the bottom sheet and having flotation means for extending the dampening means vertically, the dampening means being positioned in the waterbed mattress to prevent continuous water wave action;

c. the dampening means comprising:

(1) a box, open on the bottom, of flexible, water-impervious, sheet-like material, the open box having the approximate shape of the waterbed mattress;



(2) a plurality of openings located in two opposite vertical sides of the open box; and

(3) flotation means attached to the underside of the top of the open box.

4,192,032

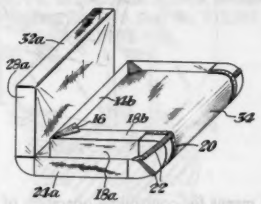
CONTOUR SHEET FOR A CONVERTIBLE SOFA BED

Fred Geraci, 4300 NW. 8th St., Plantation, Fla. 32504

Filed Mar. 20, 1978, Ser. No. 890,600

Int. Cl.[2] A47G *9/02*

U.S. Cl. 5—497 **1 Claim**



1. A bedding sheet cover for a mattress employed in a sofa bed in which the mattress includes folded portions to insure that the mattress cover remains stretched to prevent entanglement with frame members of the sofa bed comprising:

a fabric sheet having a portion sized to cover the top of the mattress, said fabric sheet including first and second end panels which overlap the mattress at each end, said first and second end panels including a bottom overlapped portion for overlapping the bottom of the mattress at each end, and

a plurality of side panels, said side panels being spaced apart sufficiently to accommodate for a particular fold of the mattress in the stowed position, said side panels joined by elasticized bands.

4,192,033

SHOE UPPER CONFORMING MACHINES

David C. Reedman, Skillington; Joseph A. Shutt, Rearsby, and Alan M. Peck, Leicester, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Apr. 13, 1978, Ser. No. 895,741

Claims priority, application United Kingdom, Apr. 16, 1977, 15876/77

Int. Cl.[2] A43D *21/00*

U.S. Cl. 12—10.1 **13 Claims**

1. A shoe upper conforming machine comprising:

a support by which a form, on which a shoe upper is to be conformed, can be supported with an insole held against the bottom thereof;

gripper means including a plurality of grippers each operable to grip a marginal portion of a shoe upper carried on a form supported by said support;

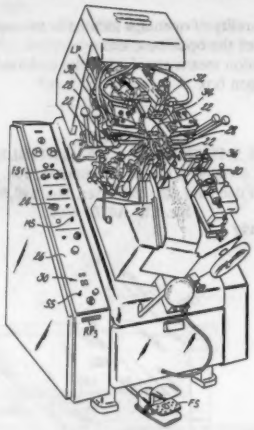
means for effecting relative movement between said support

and the gripper means whereby, when the machine is in use and marginal portions of a shoe upper are being gripped as aforesaid, such upper can be caused to be tensioned over the form;

wiper means movable from a retractable position into an operative position in which, when the machine is in use, an upper tensioned as afforesaid can be held between the wiper means and an insole held against the bottom of the form;

actuating means for causing the wiper means to move between said positions as aforesaid;

gripper actuating means for operating each gripper to close to grip a marginal portion of a shoe upper as aforesaid; and



control means for controlling operation of both the actuating means for the wiper means and also the gripper actuating means, whereby the wiper means is caused to move from its retracted to its operative position and, when the machine is in use and with marginal portions of a shoe upper gripped and the upper tensioned as aforesaid, the grippers are caused to release such upper in timed relation with such movement of the wiper means, said control means comprising a computer control which supplies control signals sequentially, according to a programmed instruction, to the actuating means for the wiper means and to the gripper actuating means.

4,192,034

BOWLING BALL CLEANER WITH PNEUMATIC CONTROL OF BALL LIFT, BRUSHES AND CLEANING COMPOUND

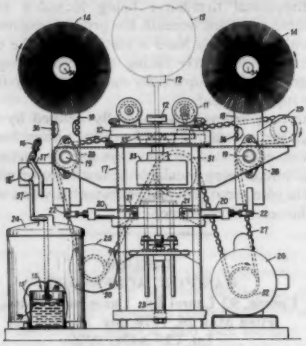
William H. Knepper, Jr., Mansfield, Ohio, assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,531

Int. Cl.[2] A63B 47/04

U.S. Cl. 15—21 A **6 Claims**

1. In a bowling ball cleaner having means for rotating the ball and a rotary brush engageable with the ball to clean the same, said cleaner including a spray nozzle adjacent to said brush, a container of cleaning compound slurry, and hose means connecting said container to said nozzle for depositing a spray of said slurry on said brush, a compressed air tank, said container of slurry comprising a replaceable open can of said slurry in said tank, a float disc in said can resting on top of said



slurry, and said hose means extending to an aperture formed in said disc.

4,192,035

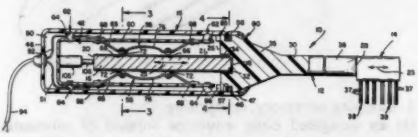
ULTRASONIC TOOTHBRUSH

Arthur Kuris, Riverdale, N.Y., assignor to Ultrasonic Plaque Control Laboratories, Inc., New York, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,663

Int. Cl.[2] A46B 13/02

U.S. Cl. 15—22 R **28 Claims**



1. Apparatus for use in personal dental hygiene care comprising:

A. an elongated member formed at least in part of a piezoelectric member with a pair of contacting surfaces intermediate the respective ends thereof,

B. a brush member adapted to be received within the human mouth and moved across tooth and gingival surfaces and extending from one end of said elongated member,

C. a casing adapted to be held in the hand and of a length at least equal to said piezoelectric member and having an elongated bore adapted to receive said piezoelectric member of said elongated member,

D. sealing means in said bore to engage said elongated member in readily releasable and in a fluid-tight fashion,

E. electrical contact means contained in said casing for releasable engagement with said contacting surfaces of said piezoelectric member of said elongated member, so as to obtain electrical contact upon the insertion of said elongated member within said bore and disengagement of said electrical contact means upon removal from said bore of said elongated member, and

F. generating means to supply alternating electrical signals to said contact means to establish an alternating field for transmission from said contact means to said piezoelectric member, whereby mechanical vibrations at the frequency of said alternating signals are induced in said elongated member and said brush member.

4,192,036

APPARATUS FOR PROCESSING THE SURFACE OF BODIES HAVING IRREGULAR CONTOURS

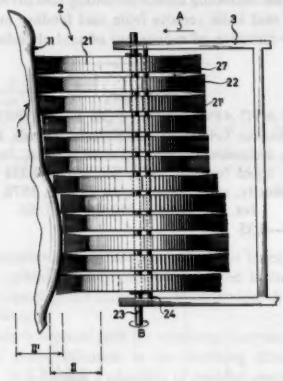
Friedhelm Heymann, Thranestrasse 90, D-4600 Dortmund 12, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,159

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733091

Int. Cl.² B60S *3/06*

U.S. Cl. 15—53 AB **16 Claims**



1. Apparatus for processing the surface of bodies of irregular contours, comprising: a rotatable body; a drive shaft mounted in said rotatable body for driving said body, said body being held against a surface to be processed; said rotating body comprising a plurality of sections held against said surface, said sections carrying processing means for said surface, said sections of said rotating body being eccentrically penetrated by said drive shaft; drive wheels arranged on said drive shaft and acting from the inside on each of said sections; guide means pivotal relative to said drive shaft and relative to said sections for positioning said sections on said shaft.

4,192,037

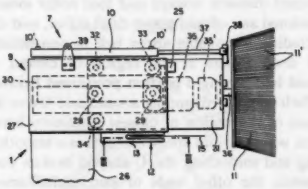
WHEEL-SCRUBBING MECHANISM FOR VEHICLE-WASHING APPARATUS

Uberto Capra, Alte Ceccato, Italy

Filed Aug. 15, 1978, Ser. No. 933,981

Int. Cl.² B60S *3/06*

U.S. Cl. 15—53 B **8 Claims**



1. In an apparatus for washing a wheeled vehicle, including a support movable relatively to a vehicle to be washed and provided with body-scrubbing means,

the combination therewith of at least one wheel-cleaning unit on said support comprising:

rotary wheel-scrubbing means normally laterally retracted from the path of relative vehicle motion;

reciprocable transport means linking said wheel-scrubbing means with said support;

normally withdrawn feeler means extendible across the course of a vehicle wheel to be scrubbed;

actuating means programmed to extend said feeler means upon the approach of said vehicle wheel during relative displacement of said support and said vehicle; and

switch means triggerable by said feeler means in an extended position thereof, upon contact with said vehicle wheel, for activating said wheel-scrubbing means and commanding said transport means to advance said wheel-scrubbing means into operative engagement with said vehicle wheel.

4,192,038

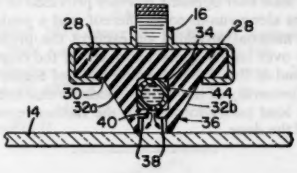
APPARATUS FOR CLEANING AND/OR COATING

Bernard J. Klein, 140 Peach Dr., Rosyln, N.Y. 11576, and Samuel D. Verga, 75 W. 238th St., Bronx, N.Y. 10463

Continuation of Ser. No. 692,543, Jun. 3, 1976, abandoned. This application Dec. 22, 1978, Ser. No. 972,455

Int. Cl.² B60S *1/46*

U.S. Cl. 15—250.06 **5 Claims**



1. Apparatus for cleaning and/or coating generally smooth surfaces and the like comprising a generally elongated unitary member including a pair of spaced apart and generally parallel blade projections extending from and along one side thereof and being adapted to contact the surface such that whenever said unitary member is positioned against the surface and is moved in a first direction, a first projection serves as a leading blade for removing surface dirt from the surface, and the second projection serves as a trailing blade which functions to evenly wipe the surface, and when said unitary member is moved in the opposite direction said second projection serves as a leading blade which removes the dirt from the surface and said first projection serves as a trailing blade for evenly wiping the surface, conduit means positioned between said projections such that it is spaced from the surface, said conduit means having a plurality of spaced passages for dispensing a plurality of streams of an appropriate fluid directly onto the surface between said blade projections for cleaning and/or coating the surface, at least one flexible lip member formed integrally with each of said projections, said lip members being generally perpendicular to their associated projection and extending toward each other and in combination, over a major portion of the space between said projections so as to retain said conduit means in position therebetween, the free end portions of said lip members being separated by a space which permits the passage of the streams of fluid from said conduit means and said lip members being movable generally apart from each other for permitting removal and/or replacement of said conduit means between said projections.

4,192,039

DOOR GUIDANCE, ESPECIALLY FOR THE TAIL DOOR OF A STATION WAGON

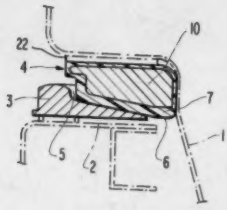
Fritz Häberle, and Hermann W. Kurth, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,834

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745120

Int. Cl.[2] E05F *5/00*

U.S. Cl. 16—86 B 5 Claims



1. A guide for doors which includes a first member having at least one wedge-shaped recess therein, a second member having at least one projection adapted to be insertable into the at least one wedge-shaped recess during a closing of the door, and a buffer means of an abrasion-resistant elastic material provided on the at least one projection, characterized in that at least two spaced projections are provided on said second member, said spaced projections define therebetween a further recess, at least two opposed recesses provided in each of the projections along run-in zones thereof, and a projecting bead of elastic material provided on each of the projections and extending over lateral contact surfaces of the respective projections, and in that the projecting bead of elastic material is disposed forwardly of the further recess so that the projecting bead is at least partly forced into the further recess during a closing of the door.

4,192,040

APPARATUS FOR CUTTING OPEN AND CLEANING THE STOMACHS OF SMALL ANIMALS, FOR EXAMPLE POULTRY

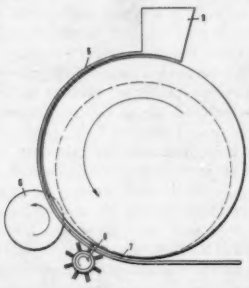
Harry Gielnik, Bremen, Fed. Rep. of Germany, assignor to Münchmeyer & Co., Hamburg, Fed. Rep. of Germany

Filed Sep. 28, 1978, Ser. No. 946,558

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1977, 2744456

Int. Cl.[2] A22C *21/06*

U.S. Cl. 17—11 7 Claims



1. In apparatus for cutting open and cleaning the stomachs of small animals, said apparatus comprising a conveying wheel, means for driving said conveying wheel, means defining a plurality of chambers for holding said stomachs around the periphery of said conveying wheel, means for feeding said stomachs to said chambers, a knife, means supporting said knife in a position in which said knife extends into the path of movement of said chambers, whereby said knife cuts open stomachs in said chambers, and a device for cleaning said stomachs after they have been cut open by said knife, the improvement wherein said wheel includes means for decreasing and increasing the sizes of said chambers as said wheel rotates, and wherein divider means is provided for prizing open said stomachs and removing hard skin from within said stomachs, said divider means including means mounting said divider means on the side of said knife remote from said feeding means considered in the direction of movement of said chambers.

4,192,041

METHOD AND APPARATUS FOR FORMING A SLIVER

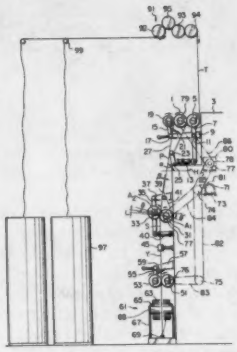
Yoshiyuki Sasaki, Takatsuki, and Kiyoshi Harada, Ibaraki, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 23, 1977, Ser. No. 854,331

Claims priority, application Japan, Dec. 3, 1976, 51-144619

Int. Cl.[2] D01G *1/08;* D01H *5/86*

U.S. Cl. 19—0.35 6 Claims



1. An apparatus for converting a multifilament bundle into a sliver comprising a feed roller means for supplying said bundle and a draft roller means comprising upper and lower opposed draft rollers having a peripheral speed higher than that of said feed roller means, said peripheral speed being at least 200 meters/min., for stretch breaking said multifilaments in said bundle between said feed roller means and said draft roller means, the broken multifilaments having U-shaped ends, the rotational axis of said lower draft roller being displaced a predetermined distance toward said feed roller means relative to the rotational axis of said upper draft roller, said draft roller means including a movable apron belt in non-sliding contact with said draft rollers at the region of closest proximity thereof, said belt having a portion positioned below the yarn path, said belt partially wrapping around said lower draft roller downstream of the region of closest proximity between said fraft rollers, whereby said apron belt acts as a smoothing means for holding and smoothing the U-shaped broken ends of said multifilaments, the other ends of said multifilaments being supplied from said feed roller means, and for positioning said broken ends parallel to the feeding direction of said bundle before each of said multifilaments is subjected to a stretch breaking operation between said feed roller means and said draft roller means, said apron belt being positioned to maintain said multifilaments adjacent the periphery of said upper draft roller through a circumferential angle in the range of 3 to 45 degrees, the ratio of the peripheral speed of said draft roller means to that of said feed roller means being in the range of 15 to 200.

4,192,042

APPARATUS FOR BREAKING TEXTILE FIBER BALES

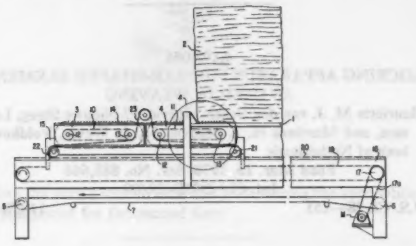
Peter Jagst, Monchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,896

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732729

Int. Cl.[2] D01G 7/04

U.S. Cl. 19—81 17 Claims



1. In an apparatus for breaking textile fiber bales, including at least two spiked breaker members rotated in the working direction for opening the bales at their underside; the improvement comprising

(a) a stationary support rack for receiving thereon a plurality of bales juxtapositioned in the working direction; said support rack having a plurality of parallel-spaced support rods extending in the working direction above said breaker members;

(b) means for moving said breaker members as a unit back and forth in the working direction underneath said support rack for opening the underside of the bales juxtapositioned on said support rack; and

(c) means providing for a displaceability of said support rack in a horizontal direction transversely to said working direction out of the operational range of said breaker members.

4,192,043

CLOSURE SEAL AND APPARATUS FOR APPLYING THE SAME

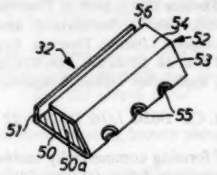
Albert Konrad, Rigistrasse 516, CH-5634 Merenschwand, Switzerland

Continuation of Ser. No. 833,206, Sep. 14, 1977, which is a division of Ser. No. 676,497, Apr. 13, 1976, Pat. No. 4,056,128. This application Jan. 16, 1979, Ser. No. 3,804

Claims priority, application Switzerland, Apr. 30, 1975, 5556/75

Int. Cl.[2] B65D 63/06

U.S. Cl. 24—21 3 Claims



1. A closure seal for use with strapping apparatus for interconnecting overlapping band sections of a plastic strap, the closure seal comprising

a floor portion having a pair of oppositely situated lengthwise extending sides,

a flange extending vertically upward from one lengthwise extending side of the floor portion,

a flap extending from the oppositely situated lengthwise extending side of the floor portion,

said flap including first and second portions, the first portion being a flap portion connected to the side of the floor portion and positioned at an inclination relative thereto, the second portion being a flap portion extending from the first portion substantially parallel to the floor portion,

said flap being bendable against the band sections to secure the band sections, and said flange being adapted to being folded over for overlapping an adjacent part of said flap, and

said flap and said floor portion having a plurality of openings, each opening extending in the connection between the flap and the floor portion and into both the floor portion and the first portion of the flap for receiving band material out of the openings to insure holding of overlapping band portions.

4,192,044

CONNECTOR AND CAPTIVE BALL INCORPORATING SAME

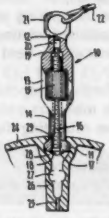
Alberto Ballerini, 207 Lennox St., Richmond, Australia

Filed Aug. 22, 1978, Ser. No. 935,798

Claims priority, application Australia, Aug. 23, 1977, 1344/77; Jun. 15, 1978, 4741/78

Int. Cl.[2] A44B 17/00

U.S. Cl. 24—211 R 10 Claims



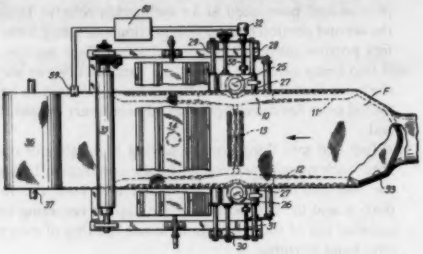
1. A connector having a generally elongated body portion which is split in a longitudinal direction from one end to a position part the way along its length so as to form two side members which are joined at said position and which may be resiliently separated at said one end, said connector having a part at or adjacent said one end which is of greater cross-sectional dimension than the cross-sectional dimension of the connector at least adjacent said part and in a direction towards said position, manually operable screw means on said connector and operable to force said two members away from each other causing said part to expand in a direction transverse to said longitudinal direction, said connector being held, by said part, in detachable connection with an article having a cavity therein accessible via a restricted neck portion in a manner wherein said connector is rotatable about the longitudinal axis thereof and at least partly pivotal in any direction relative to said article, and said connector having means adjacent the other end thereof for retaining a cord, chain, or the like.

4,192,045

ADJUSTABLE SPREADER FOR TUBULAR KNITTED FABRIC

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,135
Int. Cl.[2] D06C 5/00
U.S. Cl. 26—75 **7 Claims**



1. A variable width spreader apparatus for processing tubular knitted fabric, which comprises
(a) a pair of width adjustable edge drive carriages,
(b) means for moving at least one of said carriages toward and away from the other to effect width adjustment,
(c) edge drive rolls mounted on said carriages and movable therewith,
(d) opposed longitudinally extending spreader frame elements for reception internally of the tubular knitted fabric,
(e) each of said spreader frame elements having intermediate its ends a pair of support rollers engageable through a fabric wall with an edge drive roll, in straddling relation therewith,
(f) said edge drive rolls and said support rollers having generally complementary contours, whereby said spreader frame elements are supported and positioned by said edge drive rolls,
(g) spacer means extending between and engaging said spreader frame elements,
(h) said spacer means comprising telescopically associated guide members accommodating movement of the spreader frame elements toward and away from each other,
(i) said spacer means further comprising a gas spring element engaging said guide members and constantly urging said guide members in an extending direction,
(j) said telescopically associated guide members comprising interfitting tubular members,
(k) said gas spring being mounted within and housed by said tubular members,
(l) said spreader frame members being movable toward and away from each other by in-process adjustment of the spacing of said edge drive rolls,
(m) said spacer means having a quick-detachable association with said spreader frame elements, whereby to facilitate interchangeability of spacer means of different length,
(n) said gas spring element comprising a piston within a sealed gas cylinder precharged with a positive gas pressure.

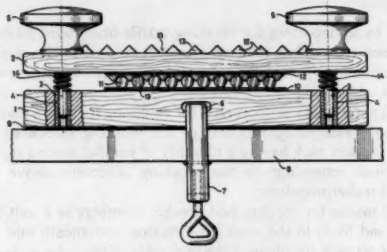
4. Apparatus for processing tubular knitted fabric, which comprises
(a) a pair of edge drive rolls,
(b) carriage means for separating said edge drive rolls,
(c) at least one of said carriages being movable toward and away from the other,
(d) controllable drive means for moving said carriage toward and away from the other as an in-process adjustment,
(e) a resiliently width-compressible spreader frame supported by and between said edge drive rolls, and
(f) a self-contained, pre-pressurized gas system including an actuator constantly engaging said spreader frame in a width-expanding direction,
(g) means for continuously sensing the edge location of the processed fabric at a location downstream of the spreader frame, and
(h) control means responsive to said sensing means for effecting in-process adjustment of the spacing of said edge drive rolls in response to wandering of said edge location beyond predetermined limits.

4,192,046

LOCKING APPARATUS FOR BAR-SHAPED ELEMENTS AS USED IN WEAVING

Henriette M. J. van den Bosch-Meevis, 97 Nieuwe Steeg, Leersum, and Martinus H. J. Meevis, 51, de Wever, Veldhoven, both of Netherlands

Filed Mar. 13, 1978, Ser. No. 885,666
Int. Cl.[2] D03D 29/00
U.S. Cl. 28—151 **11 Claims**



1. A locking apparatus for bar-shaped elements as used in weaving, comprising at least one lower block, at least one upper block, at least one releasable gripping element for fixing the blocks at a desired distance mutually with respect to each other, and bar-centering elements arranged on at least one surface of one of the blocks for holding the bar-shaped elements parallel to each other, spring means engaged between the upper block and the lower block, the spring means having sufficient compressive force when the gripping elements fix the blocks at the desired distance, as to be capable of moving the upper block upwardly and away from the lower block when the gripping means are released.

4,192,047

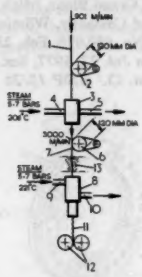
METHOD OF TREATING MULTIFILAMENT SYNTHETIC YARN

Peter W. Foster; Thomas Berry, both of Tiverton, England, and Karel Murenbeeld, Geneva, Switzerland, assignors to John Heathcoat & Company Limited, Tiverton, England

Filed Jan. 23, 1978, Ser. No. 871,334
Claims priority, application United Kingdom, Jan. 27, 1977, 3298/77
Int. Cl.[2] D02G 1/16; D02J 1/22
U.S. Cl. 28—220 **1 Claim**

1. A method of forming commercially usable textured synthetic multifilament yarn from commercially produced undrawn multifilament synthetic yarn of a type which when undrawn has normally a limited operational life and which has exceeded that normal operational life comprising the steps, performed successively without pause and as a continuous operation, of plasticizing the yarn by treatment with hot fluid

and drawing the yarn to a chosen ratio of extension while it is plasticized, cooling said plasticized and drawn yarn, then plas-



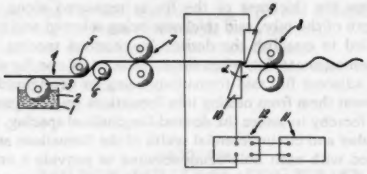
ticizing the yarn a second time and jet texturing the yarn while it is plasticized for the second time.

4,192,048

TEXTURIZING A TEXTILE PRODUCT

Jean J. Robillard, Voltaire, France, assignor to Pierre Wahl, Geneva, Switzerland

Filed Dec. 2, 1977, Ser. No. 857,179
Claims priority, application France, Dec. 2, 1976, 76 36320
Int. Cl.[2] D02G *1/00*; D02J *1/22*
U.S. Cl. 28—246 **11 Claims**



6. Apparatus for texturizing thermoplastic yarn comprising, a pair of electrodes electrically energized having surfaces over which a moistured thermoplastic yarn is advanced while the electrodes are energized, said electrodes having surfaces over which said yarn is advanced longitudinally and spaced relatively to effect a change of direction of travel of said yarn to thereby heat said yarn and crimp it, and means for advancing said yarn longitudinally subject to application of a tensile force thereto while advancing it.

4,192,049

METHOD OF MANUFACTURING BATTERY PLATES

David B. Parkinson, Cleveland Heights, and Truman D. Parkinson, Chardon, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 840,372, Oct. 7, 1977, Pat. No. 4,121,023.
This application Jun. 29, 1978, Ser. No. 920,620
Int. Cl.[2] H01M *10/04*
U.S. Cl. 29—2 **5 Claims**

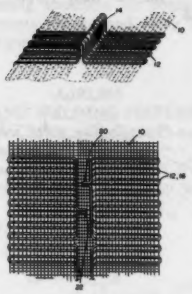
1. A method of manufacturing battery plates comprising the steps of:

weaving a web of material with discrete weft elements and with discrete warp elements, having spaced conductive material wires included as at least a portion of the discrete weft elements extending at least part way across the web, said web having a sufficient length and width to accommodate a plurality of plates at longitudinally and laterally spaced locations thereon;

providing intermediate loops in said wires between said laterally spaced locations;

severing said intermediate loops;

gathering said severed wires where they extend between said spaced locations, to form terminals for said plates;



applying active material to said web at said spaced locations so that said material penetrates said web and intimately contacts spaced portions of said wires whereby forming a plurality of spaced plates on said web; and

cutting said web as necessary to separate said plates therefrom.

4,192,050

METHOD OF MAKING A HELICALLY GROOVED ROLLER

Valentin Appenzeller, Kempen, Fed. Rep. of Germany, assignor to Eduard Kusters, Krefeld, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,559
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704157
Int. Cl.[2] B21B *31/08*
U.S. Cl. 29—148.4 D **4 Claims**

1. A method of constructing a grooved drum comprising:

(a) winding a ribbon, which is pre-profiled to have a substantially trapezoidal cross section including a base, two sloping sides extending therefrom and an outside surface opposite said base and containing a rectangular cutout on a cylindrical inner drum;

(b) stretching said ribbon during said winding because of the outside of said ribbon having a larger circumference than the inside;

(c) selecting the dimensions of said trapezoid so that, after winding, said stretching will cause a rectangular cross section to be produced; and

(d) connecting the sides of adjacent turns of the ribbons facing each other in the axial direction, to each other, in a form locking manner whereby the outside surface of said ribbon, after being wound, because of said cutout, will form a working surface with axially spaced circumferential grooves.

4,192,051

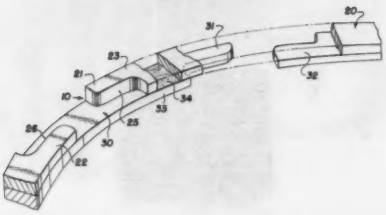
METHOD FOR MANUFACTURING FULLY SEALED PISTON RING

Alfred Bergeron, 1288 N. Bagley, Lot #6, Dallas, Tex. 75211

Continuation-in-part of Ser. No. 674,887, Apr. 8, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,206

Int. Cl.² B23P *15/08*

U.S. Cl. 29—156.6 **2 Claims**



1. A method for fabricating a unitary, fully sealed piston ring including the steps of:

(a) forming first and second split ring members with each having parallel planar side faces and generally concentric outer and inner edge faces, with said outer edge face being cylindrical when a split ring member is compressed to its intended final diameter, and each of said split ring members being formed from an annular blank whose initial circumference is greater than the intended final circumference of the piston ring by a length identifiable as the insert length, and each of said ring members being split in a generally radial direction to form first and second ends;

(b) forming circumferentially overlapping, radially contiguous fingers at the ends of said split ring members, including a radially outer finger whose exterior face constitutes a circumferential extension of the outer edge face of a split ring member, and including a radially inner finger whose interior face constitutes a circumferential extension of the radially inner face of a split ring member, with said fingers having a length less than the insert length of said blank;

(c) finishing said finger faces and said outer and inner edge faces of the ring members for sealing relation with their respective co-acting surfaces;

(d) positioning said first and second split ring members in overlying, side-by-side and contiguous relation, with the respective first ends of each of said split ring members circumferentially overlapping a body portion of the other ring member, whereby a joint is made up between the first and second ends of each split ring member when the ring member is compressed to its final diameter, and said made-up joint for each ring member overlies a body portion of the adjacent ring member, and the first and second ring members being oriented in a generally horizontal position so as to form an angle of no more than fifteen degrees with respect to horizontal at the time that joining is accomplished; and

(e) permanently joining said two ring members into a unitary assembly by means of only a single and localized silver solder joint between confronting side faces of the two ring members, each confronting side face having a flat surface with the entire surface extending only in a single plane and said solder being disposed between the flat surfaces, with the two ring members being positioned so that the silver solder joint is in close proximity to each of the two radially outer fingers, and the joining step being accomplished after the recited finishing step, and the amount of joining material being sufficiently small as to obviate any further finishing after the joining step, whereby the ring is ready for use immediately after the joining step.

4,192,052

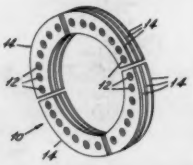
METHOD FOR BONDING A HEAT EXCHANGER FIN TO A TUBE

Robert D. MacDonald, Grand Blanc, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 660,076, Feb. 23, 1976, abandoned. This application Jul. 22, 1977, Ser. No. 817,948

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 A **2 Claims**



1. A method for forming a rotating viscous drag air-pumping heat exchanger having a fluid-carrying metal tube passing through a plurality of external sheet metal fins at closely spaced intervals along the length thereof, said tube and fins being formed and assembled by the process which comprises:

(a) forming each fin with (1) a tube-receiving hole so shaped and dimensioned that the radial gap between the outer circumference of the tube and the edge of the hole is minimal and consistent with free insertion of the tube into said hole, and (2) a series of integral narrow formations circumferentially spaced around the periphery of said hole, each formation being dimensioned to locally increase the thickness of the fin as measured along the length of the tube, said thickness being selected and controlled to establish the desired longitudinal spacing between adjacent fins when the formations of one fin abut the adjacent fin, said formations being so configured to prevent them from nesting into formations on an adjacent fin, thereby to assure the desired longitudinal spacing, the number and circumferential width of the formations associated with each hole being selected to provide a combined formation circumference which is a very small proportion of the total hole circumference, the periphery of the hole between the formations being free of any formation which increases the thickness of the fin, so that the major portion of the periphery of the hole presents a sharp edge perpendicular to and in close proximity to the tube;

(b) inserting a tube through the aligned holes of a stack of fins formed in accordance with step (a) above, each fin being pre-spaced from each adjacent fin by the narrow formations thereon, at least one of the opposed surfaces of the fins and tube outer surface being clad with a brazing composition having a melting point below the melting point of both the fin and tube base materials;

(c) brazing the fins and tube into an integral assembly by placing them into a furnace at a temperature above the melting point of said cladding but below the melting point of said base materials, thereby to form a bond between said sharp edge of the fin hole and the tube along substantially the full length of said major portion of the hole periphery.

4,192,053

METHOD FOR RETUBING A STEAM GENERATOR

Rodney A. Blanco, and Anthony A. Massaro, Jr., both of Export, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 19, 1977, Ser. No. 834,855

Int. Cl.² B23P *15/26, 7/00*

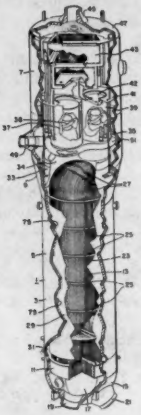
U.S. Cl. 29—157.4 **10 Claims**

1. A method of retubing a shell and tube heat exchanger

having a tube sheet with a plurality of holes disposed therein and having a plurality of tubes extending from one side of the tube sheet to form a tube bundle, said method comprising the steps of:

providing a large opening in the shell adjacent the tube sheet to facilitate access to the tube bundle;

cutting a short segment from the tubes adjacent the tube sheet;



freeing the tube bundle from the tube sheet as a unit and leaving a stub tube in the tube sheet;

separating the shell and removing a portion thereof;

removing the freed tube bundle from the shell;

removing the stub tubes from the tube sheet;

installing new tubes in the holes in the tube sheet to form a new tube bundle; and

reassembling the shell.

4,192,054

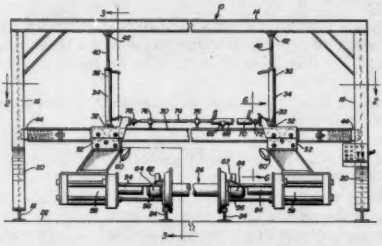
RAILROAD ROLLER BEARING PULLER

Jack E. Webb, 3530 Hawthorne Rd., Pocatello, Id. 83201

Filed Oct. 17, 1978, Ser. No. 953,893

Int. Cl.[2] B23P *19/02*

U.S. Cl. 29—252 **12 Claims**



1. A railroad wheel bearing puller for pulling the bearings from both ends of an axle/wheel assembly of the type including a pair of opposite end stub axle portions upon which the bearings to be pulled are mounted and which project outwardly from the remote sides of the wheels of said assembly, said puller including an overhead mount for disposition over a section of track along which axle/wheel assemblies may be rolled, an elongated horizontal support structure for disposition transverse to said track section, suspension means adjustably suspending opposite end portions of said support structure from said mount, a pair of followers mounted on said support structure for guided movement therealong, first motor means adjustably varying the spacing between said followers, a pair of opposing wheel bearing engaging and pulling fixtures dependingly supported from said followers and axle end engaging abutments supported from said followers for shifting relative thereto toward and away from each other, and second motor means operatively connected between each follower and the corresponding abutment for controllably inversely shifting said abutments toward and away from each other relative to said fixtures.

4,192,055

BAND WELDING FIXTURE

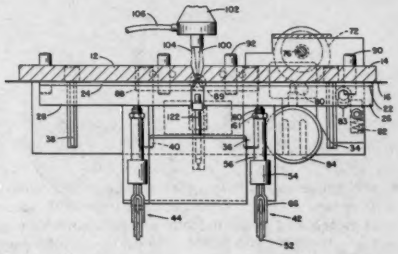
Donn F. Moore, Utica, Mich., assignor to Computer Peripherals, Inc., Minneapolis, Minn.

Division of Ser. No. 835,112, Sep. 21, 1977, Pat. No. 4,139,145.

This application Aug. 28, 1978, Ser. No. 937,349

Int. Cl.[2] B25B *11/02*

U.S. Cl. 29—281.4 **16 Claims**



1. A band end welding fixture comprising, a

pair of adjacent support members, one being tiltable in relation to the other for providing end alignment of the band,

means carried by said support members for providing edge alignment of the band,

means for clamping said band on said support members when positioned in edge alignment and having its ends abutting one another,

means for tilting said one support member to align the ends of said band prior to welding thereof, and

circuit means coupled with said alignment means for indicating edge alignment of the band during welding of the aligned ends thereof.

8. A welding fixture for connecting the ends of a print band to form an endless loop, said fixture comprising a pair of plate members positioned adjacent one another to provide a gap therebetween, a

plurality of print band alignment members carried by said plate members to align the edge of said print band,

means for holding said print band in the edge aligned position against said plate members wherein the ends of said print band are engageably disposed at said gap, and

means for tilting one of said plate members in relation to the other to align the ends of said print band prior to welding thereof, said means for tilting one of said plate members including a shaft and camming means operable upon rotation thereof to move one plate member at an obtuse angle from the other plate member.

4,192,056

ASSEMBLY TOOL

Maurus C. Logan, Elizabeth, N.J.; John M. Cole, New Hope, Pa., and Peter Garner, Chatham, N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

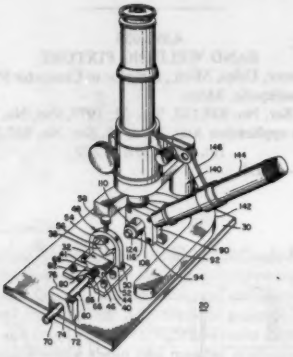
Filed Dec. 14, 1977, Ser. No. 860,576

Int. Cl.[2] G02B *5/14*; B23Q *3/00*

U.S. Cl. 29—468 **4 Claims**

1. A tool for positioning an optical fiber within a connector,

comprising; gauge means having an index thereon to indicate the desired position of an optical fiber within a connector; connector support means for engaging and retaining a connector having an optical fiber therein and means for moving said connector support means towards and away from said gauge means; a base member; stationary coupling means to couple said gauge means to said base member; movable coupling means to movably couple said connector support means so that said connector support means can be moved towards and away



from said gauge means, a first recess adjacent said connector support means; a second recess remote from said connector support means; said means for moving said connector support means is a rotatable rod coupled to said connector support means which can be moved by an operator grasping said rod; and a stop pin coupled to said rod for engagement with either of said first or second recess upon rotation of said rod to fix the position of said connector support means at a first or a second position.

4,192,057

PROCESS AND APPARATUS FOR THE PRODUCTION OF CORROSION PROTECTION FOR CABLES MADE OF PARALLEL WIRE STRANDS

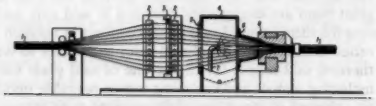
Wolfgang Borelly, Schwanenstrasse 2c, 6800 Mannheim 51, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 631,322, Nov. 12, 1975, Pat. No. 4,117,582, which is a division of Ser. No. 439,742, Feb. 5, 1974, Pat. No. 3,919,762, which is a continuation-in-part of Ser. No. 385,683, Aug. 6, 1973, abandoned. This application Nov. 3, 1976, Ser. No. 738,545

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2549299

Int. Cl.[2] B23P *3/00*

U.S. Cl. 29—458 **16 Claims**



1. A process for producing a parallel wire tension member protected from corrosion and for use in cable stayed bridges comprising:

(a) supplying a prefabricated parallel wire bundle from a supply source;

(b) conveying the wire bundle through a spreader and reforming die means to spread the wire strands of the bundle apart without disassembling the bundle and reforming the strands in a parallel wire bundle by collecting them together at the reforming die;

(c) injecting from within the spread strands a tacky synthetic resinous material with an anti-corrosion ingredient to coat all the strands while they are converging towards the reforming die, the resinous material being contained by an injection housing during injection and being sufficient in quantity to completely fill the interstices between the strands after the reforming strip;

(d) applying a close-fitting sheet metal casing to the composite reformed wire bundle and resinous material while the latter is still in tacky condition to thereby enclose same and to bond the casing to at least a portion of the length of the wire bundle, the quantity of the resinous material being sufficient to substantially fill the area between the wires strands and the casing, and the metal casing being longitudinally rigid to the extent that the encased wire bundle cannot be bent beyond a predetermined large radius of curvature without deforming the metal casing;

(e) curing and hardening the resinous material while the encased wire bundle is maintained in substantially straight condition, i.e., with a radius of curvature not smaller than said predetermined radius of curvature.

4,192,058

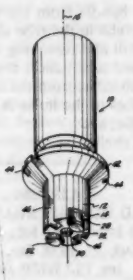
HIGH FATIGUE SLUG SQUEEZE RIVETING PROCESS USING FIXED UPPER CLAMP AND APPARATUS THEREFOR

Joseph G. Falcioni, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 11, 1977, Ser. No. 840,847

Int. Cl.[2] B23P *19/00*

U.S. Cl. 29—526 A **13 Claims**



1. A high fatigue, slug squeeze riveting process comprising the steps of:

clamping together the items to be riveted between a pair of clamps, one of which clamps remains in a fixed position relative to the riveting machine during the rivet forming process;

forming a hole in said items to be riveted together adjacent said pair of clamps;

inserting a nonheaded rivet slug into said hole from one side of said items to be riveted together;

moving spring loaded pogo feet against the side of said items facing said fixed position clamp so as to move said items away from said fixed position clamp;

pressing said rivet slug in the same direction as movement of said items to be riveted together until the rivet slug reaches a position such that a portion of said rivet slug extends outwardly from both ends of said hole;

applying a force to said rivet slug opposite said pressing direction so as to partially form a first head on the end of said rivet slug opposite said fixed position clamp;

increasing said force opposite said pressing direction after said first head has been partially formed but prior to the completion thereof, until the amount of force transmitted to the pogo feet through said rivet and said items to be riveted together overcomes said spring loading of said pogo feet and moves said items to be riveted together

toward said fixed position clamp, said increased force opposite to said pressing direction simultaneously: (i) forming a second head on the end of said rivet slug adjacent said fixed position clamp; and, (ii) completing the forming of said first head.

4,192,059

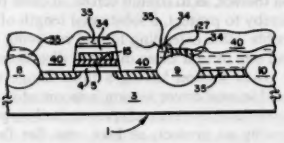
PROCESS FOR AND STRUCTURE OF HIGH DENSITY VLSI CIRCUITS, HAVING INHERENTLY SELF-ALIGNED GATES AND CONTACTS FOR FET DEVICES AND CONDUCTING LINES

Mahboob Khan, Placentia; Gordon C. Godejahn Jr., Santa Ana; Gary L. Heimbigner, and Noubar A. Aghishian, both of Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 6, 1978, Ser. No. 913,257

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **22 Claims**



1. A process for forming very large scale integrated circuits on a monocrystalline silicon semiconductor substrate having field oxide regions surrounding and isolating at least a first selected area in which a field effect semiconductor device is to be formed and at least a second selected area in which a diffused conducting line is to be formed and having polysilicon line conductors disposed on said field oxide and for providing self-aligned contacts to at least selected ones of said conductors comprising the steps of:

thermally growing a first silicon dioxide layer on each of said first and second selected areas,

forming a silicon nitride layer on said first silicon dioxide layer,

forming a silicon oxynitride layer on said first silicon nitride layer,

forming a polysilicon layer on said silicon oxynitride layer extending over said selected areas and said field oxide region,

forming a protective button on said polysilicon layer, juxtaposed over the location of a corresponding said polysilicon line conductor to be formed, and of greater width than said line,

defining a polysilicon gate electrode extending transversely and centrally of said selected area for said active device, and a polysilicon line conductor, extending at least in part over said field region, of lesser width diminsion than said button and intersecting same in an intersection region, to be formed from said polysilicon layer,

removing portions of said button to conform the width of said button to that of said intersection region with said defined polysilicon line conductor,

delineating said polysilicon layer to form said line conductor with said conformed button juxtaposed thereon and to form said gate electrode,

protecting the portions of said first silicon oxynitride and nitride layers on said source and drain regions and on a selected contact area of said diffused conducting line and removing all unprotected portions of said first silicon oxynitride and silicon nitride layers,

removing the silicon dioxide layer portions exposed by removal of said first silicon nitride layer portions,

forming a thermal oxide on exposed surfaces of said gate polysilicon layer, of said polysilicon line conductor, and of said diffused line, and

removing said first silicon oxynitride and nitride layers from said source and drain regions and said diffused conducting line and removing said button, thereby to expose said contact surfaces of said source and drain regions, of said diffused conducting line and of said polysilicon line conductor.

4,192,060

METHOD OF CONSTRUCTING LIQUID CRYSTAL DISPLAY

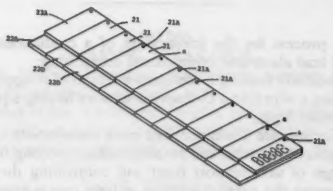
Isamu Washizuka, Soraku; Shintaro Hashimoto, Shiki; Masaru Kakumae, Yamatokoriyama; Yuuichi Sato, Nara; Isao Fujisawa, Yamatokoriyama; Yukihiro Inoue, Kashihara, and Sadakatsu Hashimoto, Yamatokoriyama, al of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 725,928, Sep. 23, 1976, Pat. No. 4,104,727. This application Dec. 21, 1977, Ser. No. 862,963

Claims priority, application Japan, Sep. 23, 1975, 50-115190; Sep. 23, 1975, 50-115191; Sep. 23, 1975, 50-115192; Sep. 23, 1975, 50-115193

Int. Cl.[2] G02F *1/13*

U.S. Cl. 29—592 R **4 Claims**



1. A method of fabricating one of a plurality of multi-digit liquid crystal display cells from at least two transparent sheets each of said at least two transparent sheets being approximately rectangular in shape, each of said sheets having a pair of substantially longitudinal ends and a pair of substantially transverse ends, each of said liquid crystal display cells having a liquid crystal composition interposed therein, comprising the steps of:

providing an alignment means for forming a plurality of grooves on a surface of said sheets;

forming a plurality of grooves on a first surface of each of said at least two transparent sheets, said formation of said grooves being performed by utilizing said alignment means, said formation of said grooves commencing along at least one of said ends of said first surface of each of said transparent sheets, said formation of said grooves continuing in substantially said one direction along said first surface of each of said transparent sheets until at least one opposite end is reached;

placing said first surface of one of said at least two transparent sheets in contact with said first surface of another of said at least two transparent sheets such that said longitudinal and transverse ends of said one transparent sheet are in alignment with said longitudinal and transverse ends of said another transparent sheet, the direction of said grooves on said first surface of said one transparent sheet being approximately orthogonal to the direction of said grooves on said first surface of said another transparent sheet thereby yielding a liquid crystal structure;

injecting a layer of said liquid crystal composition between said transparent sheets; and

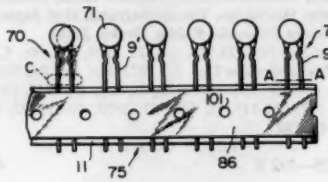
dividing said liquid crystal structure into a plurality of liquid crystal display cells, said structure being divided by providing a plurality if cuts along the longitudinal axis of said structure, each of said cuts extending along the transverse axis of said structure and extending in a direction approximately parallel to each of said transverse ends, whereby said grooves on said first surface of each of said transparent sheets are unidirectional with respect to other grooves on the same sheet.

4,192,061

PROCESS AND APPARATUS FOR MANUFACTURE OF PARALLEL LEAD ELECTRONIC COMPONENTS

Sho Masuzima, and Hisashi Fujita, both of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,303
Claims priority, application Japan, Sep. 11, 1976, 51-108989
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—854 **18 Claims**



1. A process for the preparation of a continuous web of parallel lead electronic components comprising:

continuously feeding a continuous length of a support band;

forming a wire into a U-shaped lead wire having a portion of parallel leads;

positioning said U-shaped lead wire transversely onto said support band with said parallel leads projecting from both edges of said support band and controlling the spacing between the parallel leads in at least one portion of said parallel leads projecting from said support band;

securing said U-shaped lead wire to said support band by an adhesive tape at the same time the spacing between said parallel leads is being controlled in said at least one portion; and

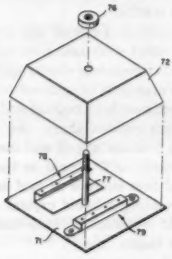
connecting an electronic component element to one end of said U-shaped lead wire.

4,192,062

TERMINATING FLAT FLEXIBLE CABLES

John W. Balde, Flemington, N.J.; Robert A. Spencer, Indianapolis, and Richard K. Thompson, Jr., Carmel, both of Ind., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 8, 1978, Ser. No. 913,765
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—857 **16 Claims**



1. Apparatus for terminating a plurality of flat flexible cables along a substantially flat surface, the apparatus comprising:

a plate having a substantially flat, first face suitable for attachment to said surface, said plate also having a second face;

means, disposed on said second face of said plate, for receiving a plurality of flat flexible cables extending to said receiving means from three different directions, said receiving means including a pair of spaced, elongated members for each receiving a different portion of each of a plurality of connectors bridging the space between said elongated members, each said connector being associated with a different one of said plurality of flat flexible cables, with one of the elongated members being mounted for pivotal movement away from a normal position thereof parallel to the other of said members so as to permit the receipt of at least one flat flexible cable from one of said three different directions, and with said pivotally-mounted, elongated member including a first flange so disposed, when the pivotally-mounted, elongated member is in said normal position thereof, as to stretch across, in close proximity to, and thereby to protect, a substantial length of said at least one flat flexible cable extending to said receiving means from said first direction;

a first cover section having a second flange so disposed, when said first cover section is mounted in a protective position thereof, as to stretch across, in close proximity to, and thereby to protect, a substantial length of at least one flat flexible cable extending to said receiving means from a second one of said three different directions;

a second cover section having a third flange so disposed, when said second cover section is mounted in a protective position thereof, as to stretch across, in close proximity to, and thereby to protect, at least one flat flexible cable extending to said receiving means from a third one of said three different directions; and

means for mounting said first and second cover sections in said protective positions thereof.

10. A method of terminating a plurality of flat flexible cables having respective connectors attached thereto at receiving means disposed on a face of a plate, the receiving means including first and second spaced connector mounting members, at least one of said members being movable, the method comprising the steps of:

(a) moving the movable member away from a normal position of the movable member wherein said movable member is parallel to the other of said members, to a cable-laying position of the movable member;

(b) extending the plurality of flat flexible cables to the receiving means with at least one of the plurality of flat flexible cables lying under said normal position of the movable member of the receiving means;

(c) moving the movable member of the receiving means from said cable-laying position of the movable member, across said at least one of the plurality of flat flexible cables, and into said normal position of the movable member; and

(d) terminating the plurality of flat flexible cables at the receiving means by attaching the connectors to the first and second members.

4,192,063

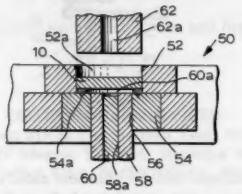
METHOD FOR MANUFACTURING A BASE OF A SEMI-CONDUCTOR DEVICE

Yoshio Sato, 23-15, 3-chome, Zenpukuji, Suginami-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 744,038, Nov. 22, 1976, abandoned. This application Jan. 24, 1978, Ser. No. 871,982
Claims priority, application Japan, Dec. 10, 1975, 50-146348
Int. Cl.[2] H01R *9/04, 43/00*
U.S. Cl. 29—591 **2 Claims**

1. A method of manufacturing a base of semiconductor device, comprising the steps of; silver soldering a metal ring composed of a copper-nickel alloy which is extrudable as well as weldable on a metal blank of thermally and electrically conductive material to thereby form a base body and at the same time form the silver of the solder and the copper-nickel alloy into a solid solution of silver and cupro-nickel for improving the bonding strength between the solder and the metal ring; providing an extrusion die having a lower extrusion die

portion with a knock-out hole having an axial length therein and a surface around said knockout hole with an annular recess therein concentric with said knockout hole and with said surface extending laterally outwardly away from said annular recess, a knockout member slidable in said knockout hole with said knockout member being in contact with the entire length of the knockout hole, an upper die portion having a blank receiving cavity therethrough and positioned on said surface around said knockout hole concentric therewith, and a punch slidable in said blank receiving cavity and having a central bore therein and an unrecessed surface on the end of said punch



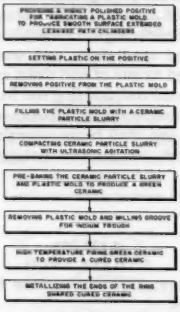
within said blank receiving cavity around said central bore, placing said metal blank in said receiving cavity with the metal ring against said lower die portion over the annular recess; and then striking the side of the base body opposite the side with the metal ring for forcing the material of the metal ring into said annular recess to form a raised annular portion on the upper surface of said base body and at the same time forming a stud on the lower surface of said base body which is to be threaded later, whereby cracks which would tend to occur in the punch if the annular recess were formed in the punch are avoided.

4,192,064

HIGH STRENGTH EXTENDED LEAKAGE PATH CERAMIC TUBE WALL FOR IMAGE INTENSIFIER AND METHOD OF MANUFACTURE

Andrew J. Kennedy, Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,016
Int. Cl.[2] H01B *19/00*
U.S. Cl. 29—631 **7 Claims**


PROVIDING A HIGHLY POLISHED POSITIVE FOR FABRICATING A PLASTIC MOLD TO PRODUCE SMOOTH SURFACE EXTENDED LEAKAGE PATH ENLARGERS
SETTING PLASTIC ON THE POSITIVE
REMOVING POSITIVE FROM THE PLASTIC MOLD
FILLING THE PLASTIC MOLD WITH A CERAMIC PARTICLE SLURRY
COMPACTING CERAMIC PARTICLE SLURRY WITH ULTRASONIC AGITATION
PRE-BAKING THE CERAMIC PARTICLE SLURRY AND PLASTIC MOLD TO PRODUCE A GREEN CERAMIC
REMOVING PLASTIC MOLD AND MILLING GROOVE FOR INDIUM TROUGH
HIGH TEMPERATURE FIRING GREEN CERAMIC TO PROVIDE A CURED CERAMIC
METALLIZING THE ENDS OF THE RING SHAPED CURED CERAMIC

1. A method of producing a smooth surfaced extended leakage path ceramic tube wall for a high voltage tube device, the steps comprising:

providing a highly polished preshaped positive for fabricating an ultrasmooth walled plastic mold having alternating convex and concave circular radius of curvatures of from $\frac{1}{2}$ to $\frac{1}{4}$ millimeter radii along the wall thereof

setting plastic on said preshaped positive to form an ultrasmooth walled plastic mold for making a smooth surfaced extended leakage path for said ceramic tube wall;

removing said preshaped positive from said plastic mold;

filling said plastic mold with a ceramic particle slurry of a vacuum tube envelope quality alumina of 95% to 98% in a granular glass binder;

compacting said ceramic particle slurry against the ultrasmooth plastic mold with ultrasonic agitation;

prebaking the combined said ceramic particle slurry and said ultrasmooth walled plastic mold to produce a ring-shaped green ceramic tube wall;

removing said plastic mold from said ring-shaped green ceramic tube wall;

making a trough in at least one end of said ring-shaped green ceramic tube wall;

high temperature firing said green ceramic tube wall to provide a cured ceramic tube wall; and

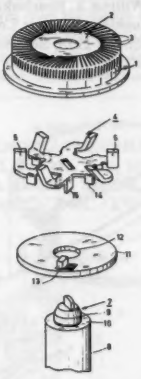
metallizing each end and said trough in at least one end of said ring-shaped cured ceramic tube wall for electrical connection to said high voltage tube device.

4,192,065

SHAVING APPARATUS

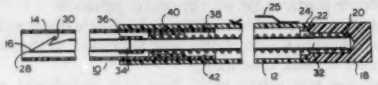
Eduard W. Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 794,565, May 6, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,536
Claims priority, application Netherlands, May 14, 1976, 7605150
Int. Cl.[2] B26B *19/14*
U.S. Cl. 30—43.6 **6 Claims**



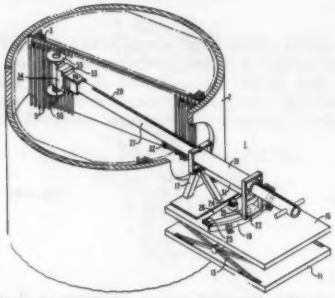
1. A shaving apparatus which comprises a shear plate formed with openings, a cutting member having a flat portion, spring means to press the cutting member against the shear plate, means including a drive shaft for driving the cutting member for rotation relative to the shear plate, said cutting member fitting over the drive shaft and engaging the same, a pair of opposed tabs bent outwardly from the flat portion of the cutting member, a disc member disposed opposite to and spaced from the flat portion of the cutting member, said disc member being freely rotatively positioned on said drive shaft, and means associated with the disc member for location between and cooperation with the pair of opposed tabs in order to couple the cutting member and the disc member, the cutting member and the disc member being thereby movable relative to each other in the direction of driving the cutting member and also being thereby movable relative to each other in a direction transverse to the direction of driving the cutting member.

4,192,066
ANTI-RAPE DEVICE
Willkie Y. Tucker, 3513 S. Crochan, Los Angeles, Calif. 90016
Filed Mar. 31, 1978, Ser. No. 892,117
Int. Cl.[2] B26B 5/00
U.S. Cl. 30—162 8 Claims



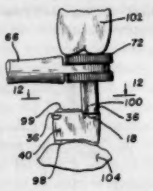
1. Personal defensive device for warding off potential rapists and other potential assailants, said device comprising a shank having a lateral offset defining a barbed point, a hand grippable barrel coaxially mounting said shank separably in point forward thrusting relation, and coaxial hood means covering said point against unintentional use and displaceably responsive to barrel thrusting of the device against an assailant to lodge the shank point in said assailant.

4,192,067
APPARATUS FOR CUTTING THROUGH A TUBE BUNDLE
Gregory L. Calhoun, Monroeville, Pa.; Arthur W. Kramer, Doctors Inlet, Fla.; Frank I. Bauer, Perry Township, Landinburg County, and William A. Bencloski, Swickley, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 23, 1978, Ser. No. 954,041
Int. Cl.[2] B23D 19/06, 21/00; B27B 7/04
U.S. Cl. 30—379 17 Claims



1. Apparatus for cutting through a tube bundle formed from closely packed tubes while the tube bundle is disposed within a vessel, said apparatus comprising:
a base,
a boom pivotally mounted with respect to said base to generally move in a plane transverse to the longitudinal axis of said tube bundle,
a pair of cutting discs rotatably disposed on one end of said boom,
said discs being disposed in planes generally parallel to said transverse plane,
means for rotating said discs, and
means for moving said discs toward and away from each other,
whereby short segments of tubes can be cut from said tube bundle to cut through the tube bundle and free it.

4,192,068
ORTHODONTIC BAND AND SEATING TOOL THEREFOR
Joseph Wolfson, Trenton, N.J., assignor to Charles Desenberg, Sarasota, Fla.
Filed Jan. 3, 1977, Ser. No. 756,058
Int. Cl.[2] A61C 7/00
U.S. Cl. 433—3 14 Claims



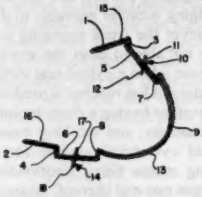
1. An orthodontic band for affixment about a tooth comprising a continuous open-ended band dimensioned to closely encircle said tooth, said open ends of said band terminating at an incisal edge and a gingival edge, said band having an inner surface for contacting said tooth and an outer surface, said inner and outer surfaces being interposed between said incisal and said gingival edges, said outer surface being provided with a plurality of integrally formed protrusions spaced about said band, said integrally formed protrusions having a rigid substantially planar engagement surface adapted to cooperate with a band seating tool, said integrally formed protrusions each being disposed a preselected distance from said incisal and gingival edges, said rigid substantially planar engagement surface being solid and continuous and tapering from said outer surface.

9. A band seating tool for seating orthodontic bands about a tooth comprising:
an elongated handle;
a seating element having a surface for cooperating with a portion of said orthodondic band; and
means for rotatably affixing said seating element to one end of said handle, the longitudinal axis of said seating element being fixed at a location transverse to the longitudinal axis of said elongated handle, said seating element being rotatable about the longitudinal axis thereof, said rotatable affixing means comprising an extensive flange provided by said one end of said elongated handle, said flange having an aperture therethrough, a rotatable element including a pair of spaced apart disks, said seating element being fixedly secured to one of said disks, and a shaft having a first and a second end, said first end fixedly secured to one of said disks, said second end fixedly secured to the other of said disks, said shaft being journaled in said aperture, said pair of disks thereby sandwiching said flange.

4,192,069
UTILITY ARCH
James R. McAndrew, 3233 S. Sherwood Forest Blvd., Baton Rouge, La. 70816
Filed May 23, 1978, Ser. No. 908,724
Int. Cl.[2] A61C 7/00
U.S. Cl. 433—21 9 Claims

1. A utility arch used in straightening teeth constructed from bendable wire and having first and second molar sections, first and second buccal sections and an anterior section, the improvement of which comprises a first post means fixedly attached to said buccal section, second post means fixedly attached to said second buccal section, said first and second post

means having ends extending above and below, respectively, said first and second buccal bridge section, and a first coil

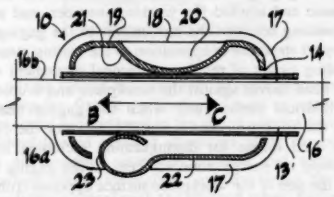


spring wound around said wire between said first and second post means.

4,192,070
ORTHODONTIC DEVICES

Marc S. Lemchen, 219 E. 81st St., New York, N.Y. 10028; Ian M. Chong, 17 Monroe Pl. #1A, Brooklyn Heights, N.Y. 11201, and Carlton Klein, 69-05C 186 La., Fresh Meadows, N.Y. 11365

Filed Jan. 16, 1978, Ser. No. 869,420
Int. Cl.² A61C *7/00*
U.S. Cl. 433—11 **8 Claims**

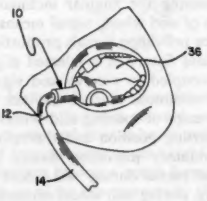


1. An orthodontic locking device for use with an arch wire having uniform surfaces, said device comprising means defining a passage for the insertion of the arch wire and means defining a tension spring for bearing against the arch wire the tension spring being oriented relative to the arch wire at an angle of less than 90°, the tension spring having a free end portion for bearing against the arch wire and being fixed at its other end, the free end portion of the tension spring always being in engagement with the arch wire so that movement of the arch wire toward said free end portion causes said free end portion to hield and movement of said arch wire away from said free end portion causes the free end portion to lock the arch wire.

4,192,071
DENTAL APPLIANCE

Norman Erickson, 1215 Felicita La., Escondido, Calif. 92025

Filed Jan. 30, 1978, Ser. No. 873,430
Int. Cl.² A61C *17/04*
U.S. Cl. 433—93 **11 Claims**



1. A collector member having a semi-rigid bite block deforming upon the initial bite of the patient so as to form a mold thereof for secure placement within the patient's mouth and which bite block portion resists further deformation permitting the patient to exert substantial pressure on said bite block portion:

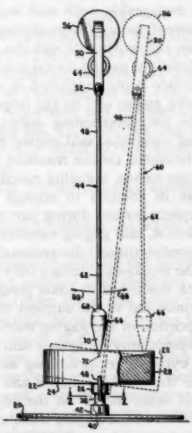
a combination tongue guard and collector membrane holder connected to said bite block portion which is captured within the patient's mouth, said combination tongue guard collector membrane holder having a top surface and a bottom surface, said combination tongue guard and collector membrane holder also having an uninterrupted slot formed therein that passes substantially vertically therethrough from said top surface to said bottom surface thereby forming a first and a second foot member on the opposite sides of said slot;

a resilient collector membrane having a thickness substantially as wide as said slot formed in said combination tongue guard and collector membrane holder so that said resilient collector membrane is frictionally removably held within said slot between said first and second foot members, said membrane when placed into its functional position within the patient's mouth is essentially folded in a concave fashion across its length to form a top of the mouth portion and a bottom of the mouth portion, the peripheral contour of the bottom of the mouth portion forms a sealing contact with the soft tissues overlying the mylohoid line of the mandible, the bottom portion of the mandible forms a dam or reservoir for the collection of fluids and saliva generated, the lateral edges of the collector membrane where it is folded upwardly lies in sealing contact with tissue covering the internal walls of the ascending ramus of the mandible, and the top of the mouth portion of the collector membrane extends forwardly from the folded area over the palate where it conforms to and lies on the maxillary and palatal tisue thereby functioning to separate the mouth into a forward compartment that is being worked on and a rear compartment.

4,192,072
PENDULUM DEVICE

Thomas E. Truitt, P.O. Box 251, Polo, Mo. 64671

Filed Feb. 23, 1978, Ser. No. 880,583
Int. Cl.² B43L *11/00*
U.S. Cl. 33—27 L **16 Claims**



1. A kinetic sculpture apparatus comprising:

a receiver containing a fine, particulate material presenting a bed thereof;

a pendulum having an upper end and a lower end, the latter presenting a scribe;

means above said receiver suspending said pendulum thereover with said scribe contacting said material at a predetermined point in the bed when the pendulum is at rest, and establishing a primary, generally horizontally disposed axis of swinging movement of the pendulum,

said upper end of the pendulum being provided with a secondary coupling connecting the pendulum to said suspension means;

standard means secured to said receiver and extending upwardly to said suspension means to support the same;

a base; and

means mounting said receiver on said base spaced thereabove for tilting movement of the receiver, and hence the standard means, to any of a number of positions in which the receiver and standard means are tilted relative to the base and said primary axis is horizontally displaced, whereby said predetermined point of contact of the scribe may be moved to center the point in the bed or locate said point away from the center so that subpatterns may be sculptured.

4,192,073

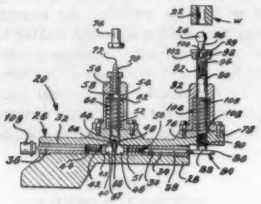
PROCESS GAGING APPARATUS

Frank E. Vanderwal, Jr., St. Louis County, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Jan. 26, 1978, Ser. No. 872,557

Int. Cl.[2] G01B *5/08, 7/12*

U.S. Cl. 33—178 B **6 Claims**



2. Apparatus for terminating a machine operation on a workpiece having a surface thereon to be machined when a predetermined condition of a workpiece surface is reached comprising working means engageable with said workpiece surface during machining thereof, means for producing relative reciprocal motion between the workpiece and the working means during a machine operation, gaging means positioned adjacent to the workpiece surface being machined in spaced opposed relation to the working means and on the opposite side of the workpiece therefrom for determining when the surface is machined to a desired condition, said gaging means including a support structure mounted on the machine in fixed spaced relation to the working means, a gaging member mounted on the support structure in position to engage the workpiece adjacent to the workpiece surface during part of each cycle of relative reciprocal motion, said gaging member having a work engaging portion of predetermined dimensional characteristics capable of entering the workpiece surface only after the workpiece surface has been machined to some predetermined size, means operatively connected to the support structure biasing said work engaging portion of the gaging member toward the workpiece, said workpiece moving against said work engaging portion during each cycle of reciprocating movement of the workpiece relative to the working means and relative to the support structure, and other means on the support structure responsive to the position of the gaging member thereon, said other means including a second member mounted on the support structure in spaced relation to the work engaging portion of the gaging member, said second member being engageable during a portion of each cycle of relative reciprocal motion by means fixedly attached with respect to the meand for supporting the workpiece, means forming an operable connection between the work engaging portion and the second member, and means on the gaging member movable to disable the connection means whenever the work engaging portion engages the workpiece but is not able to enter the work surface.

3. Apparatus to sense when a cylindrical surface in a workpiece that is being enlarged has reached a predetermined diameter, the cylindrical surface having a diameter initially less than the predetermined diameter, and working means operatively engageable with said cylindrical surface for enlarging the surface, said working means being positioned to enter the cylindrical surface from one end thereof, means for producing relative reciprocal movement between the working means and the cylindrical surface, the improvement comprising means movable into engagement with the workpiece adjacent to the opposite end of said cylindrical workpiece surface from the end where the working means enters including a gaging assembly having a support structure that is fixed relative to the working means, a gaging head on said support structure characterized by being able to enter the cylindrical surface only after the diameter of the cylindrical surface has been enlarged to said predetermined diameter, said gaging head being positioned on the gaging assembly in position to move against the workpiece adjacent to said cylindrical surface during a portion of each cycle of said relative reciprocal movement, means biasing the gaging head on the support structure toward the workpiece and toward the working member, and means for distinguishing between the movements of the gaging head on the support structure in opposition to the biasing means during succeeding cycles of relative reciprocal movement when the gaging head moves against the workpiece and is able to enter the cylindrical surface and when the gaging head moves against the workpiece and is not able to enter the cylindrical surface, said means for distinguishing including means for establishing an energy zone adjacent to the gaging assembly and on the side of the workpiece surface opposite from the end where the working means enter, and means connected to the gaging head movable into the energy zone during a portion of each cycle of relative reciprocal movement thereby producing an output signal every time the gaging head is engaged with the workpiece but is unable to enter the cylindrical workpiece surface, said means connected to the gaging head not moving into the energy zone during the first cycle of relative reciprocal movement when the gaging head is able to enter the cylindrical workpiece surface so as not to produce an output signal.

4,192,074

ON THE FLY RUN-OUT CORRECTION FOR VEHICLE ALIGNMENT

Andrew K. Chang, Malibu, Calif., assignor to FMC Corporation, San Jose, Calif.

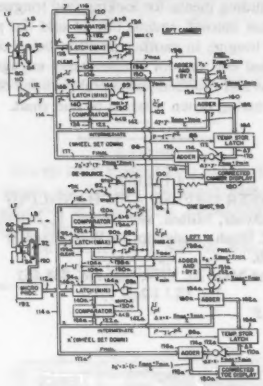
Filed Dec. 22, 1977, Ser. No. 863,196

Int. Cl.[2] G01B *19/295, 19/575*

U.S. Cl. 33—228 **14 Claims**

13. The method of correcting for test instrument run-out error of vehicle wheels wherein a test instrument is installed on the wheel under test, said test instrument comprising a fixture that is detachably mounted on said wheel, sensor means on said fixture for detecting the angular inclination of said fixture during rotation of said wheel, signal means responsive to said sensor means for providing signals proportional to the angular inclination of said fixture in a selected alignment plane, and circuit means coupled to receive said signals and including maximum and minimum storage devices; the improvement comprising the steps of rotating said wheel at least 360° from any random starting position and thereafter stopping wheel rotation, continuously providing fixture inclination signals from said signal means during said wheel rotation, continuously comparing, during said wheel rotation, the present inclination signal with the previous inclination signals from said maximum and minimum signal storage devices, admitting the

present inclination signal to said maximum signal storage device only when the present inclination signal is greater than that previously stored in said maximum signal storage device, and admitting the present inclination signal to said minimum signal storage device only when the present inclination signal is less than that previously stored in said minimum signal storage, thereby obtaining from said continuously provided inclination signals the maximum and minimum angular fixture inclination signals in said alignment plane relative to a selected



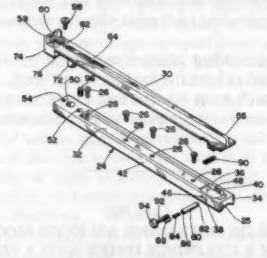
reference plane, taking half the sum of said maximum and minimum angular fixture inclination signals to provide an inclination signal proportional to the actual angular inclination of said wheel in said selected alignment plane stopping the wheel at any random rotational position and sensing the stopped wheel fixture inclination, and combining the actual angular inclination signal with the stopped wheel fixture inclination to provide a run-out error signal indicative of the portion of maximum angular fixture run-out existing at the random stopped position.

4,192,075

PLATFORM RAMP SIGHT FOR FIREARMS

Travis R. Strahan, Rte. 7, Townsend Cir., Ringgold, Ga. 30736

Filed Dec. 28, 1978, Ser. No. 974,053
Int. Cl.[2] F41G *1/02*
U.S. Cl. 33—257 **11 Claims**



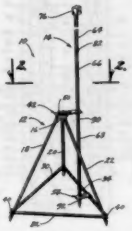
1. A target sight for hand-held firearms having a gun barrel and a frame to which the barrel is secured, said target sight comprising a base member adapted to be secured to said barrel, a platform on said base member, a rear sight upstanding rib member on said platform having a notch formed therein positioned above the frame of the gun rearwardly of the barrel, and a front sight member on said platform, said front sight member comprising an elongated ramp laterally aligned with said notch positioned above the barrel at the front thereof and extending rearwardly to a rear terminus disposed rearwardly of the barrel adjacent said rear sight, said ramp being tapered from a maximum elevation adjacent the front above the barrel to a minimum elevation below the notch at the rear.

4,192,076

DEVICE FOR HOLDING A SURVEYOR'S INSTRUMENT

George W. Hall, 3200 Viking Dr., Sioux City, Iowa 51104

Filed Oct. 23, 1978, Ser. No. 953,704
Int. Cl.[2] G01C *15/08*
U.S. Cl. 33—296 **10 Claims**



1. A device for holding a surveyor's stake comprising:
a tripod having a platform member and three legs hingedly connected at their upper ends to said platform member;
three connecting members interconnecting said lower ends of said legs, each of said connecting members having one of its ends detachably secured adjacent the lower end of one of said legs and the other of its ends detachably secured adjacent the lower end of another of said legs, whereby said connecting members when so secured to said legs hold said legs against pivotal movement of said legs about their hinged connections to said platform member; and
stake holding means on said tripod for holding said stake against movement with respect to said tripod,
said stake holding means comprising an upper bracket and a lower bracket, said upper bracket being operatively mounted to said platform and said lower bracket being operatively connected to one of said connecting members.

4,192,077

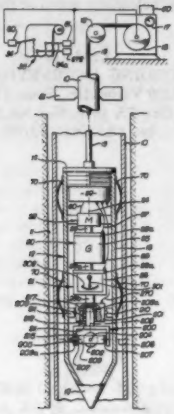
SURVEY APPARATUS AND METHOD EMPLOYING RATE-OF-TURN AND FREE GYROSCOPES

Donald H. Van Steenwyk, San Marino; John R. Cash, and Paul W. Ott, both of Pasadena, all of Calif., assignors to Applied Technologies Associates, San Marino, Calif.

Filed Jul. 17, 1978, Ser. No. 925,307
Int. Cl.[2] E21B *47/024*; G01C *19/00*
U.S. Cl. 33—313 **18 Claims**

1. In apparatus for determining azimuth, the combination that comprises
(a) a rate-of-turn gyroscope including a first rotor having a spin axis,
(b) support means to support the gyroscope for lengthwise travel along another axis generally normal to said spin axis, and to rotate about said other axis,
(c) said gyroscope having first means for producing an output which varies as a function of azimuth orientation of the gyroscope relative to the earth's spin axis, and
(d) a free gyroscope operatively carried for movement along said other axis with said rate-of-turn gyroscope, said free gyroscope including a second rotor having a spin axis subject to alignment,
(e) said free gyroscope also having means for producing an output which varies as a function of azimuth orientation of the free gyroscope,
(f) other means responsive to the output of the rate-of-turn

gyroscope to effect said alignment of the free gyroscope spin axis, and



(g) control means connected with said other means to periodically cause said other means to effect said alignment, while said travel is effectively interrupted.

4,192,078

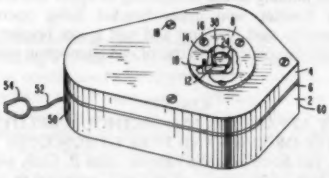
AUTOMATICALLY RETRACTABLE CHALK AND PLUMB LINE ASSEMBLY

Nicola Lore, 35 Burkhardt Ave., Bethpage, N.Y. 11714, and Corrado Lore, 65 Benedict Ave., Valley Stream, N.Y. 11580

Continuation of Ser. No. 865,717, Dec. 29, 1977, abandoned. This application Apr. 27, 1979, Ser. No. 34,123

Int. Cl.[2] B44D *3/38*

U.S. Cl. 33—414 **3 Claims**



1. Automatically retractable chalk and plumb line assembly, comprising a housing in the form of a plumb bob having tapered lower and upper ends and being divided into two compartments, said housing being formed with a first and a second opening into one of said compartments, said second opening being located in an upper end of said one compartment, a reel disposed in said one compartment with a plumb line wound thereon and being unwindable so as to extend out of said housing through said second opening, said one compartment being fillable through said first opening with powdered chalk freely engageable with said reel and plumb line disposed within said one compartment, the other of said compartments being sealed against penetration by chalk from said one compartment and having a helical spring disposed therein for rewinding said plumb line on said reel, and including a wall disposed between said compartments, and a rotatable shaft disposed in said other compartment and extending therefrom into said one compartment, said helical spring being secured at one end thereof to said rotatable shaft in said other compartment and at the other end thereof to another location within said other compartment, said reel being mounted on said shaft in said one compartment, said other compartment being formed with an opening through which an end of said rotatable shaft extends, and including an L-shaped tongue having a rounded end and being engageable with said end of said rotatable shaft for inhibiting rotation thereof, said tongue being slidable in a groove formed in said housing and located adjacent said opening formed in said other compartment, and including means for locking said tongue against said end of said rotatable shaft, said end of said shaft being formed with at least one flat portion at the periphery thereof and including means for locking said tongue, in a fully extended position thereof, against one of said flat portions of said shaft, said tongue, in another position being disposed so that said rounded end thereof is alternately engageable with said flat portions and rounded peripheral portions of said shaft for gradually slowing down rotation of said shaft.

4,192,079

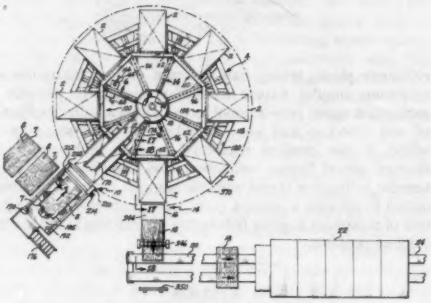
VENEER DRYING AND HANDLING

Byron B. Brookhyser, Milton, and Darrell E. Pierson, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,451

Int. Cl.[2] F26B *7/00*

U.S. Cl. 34—13.8 **23 Claims**



1. An apparatus for drying veneer, comprising:

a plurality of modular hot presses mounted adjacent one another with each press having at least two metal plates to form an opening for the insertion therebetween of wet veneer sheets,

means for loading each press with wet veneer sheets,

means for unloading each press after the sheets of veneer are dry,

means for providing relative movement between the hot presses and at least the loading means, and

means on each press for exerting a predetermined contact pressure on the wet veneer at a predetermined temperature and for a predetermined time.

4,192,080

METHOD OF OBTAINING AN EVEN MOISTURE PROFILE IN A CYLINDER DRIER AND A MEANS FOR CARRYING OUT THE METHOD

Eero A. Irpola, Tuureporinkatu 13 E, SF-20100 Turku 10, Finland

Filed Jan. 12, 1978, Ser. No. 868,753

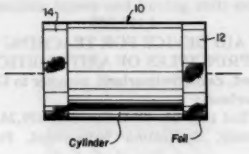
Claims priority, application Finland, Feb. 4, 1977, 770385

Int. Cl.[2] F26B *3/24*

U.S. Cl. 34—41 **5 Claims**

1. Method to improve the drying characteristics of the cylinder drying section of a paper or cardboard machine so that an essentially even transverse moisture profile of the dried paper

or cardboard web is achieved by this dryer, the improvement comprising coating of the rim areas of the outer jacket surface



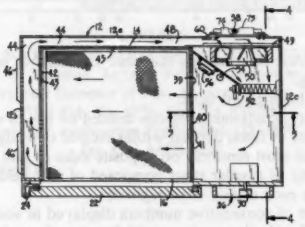
of at least some of the drying cylinders with a heat insulating foil.

4,192,081

FOOD DEHYDRATING MACHINE

Chad S. Erickson, and David A. Dornbush, both of Minneapolis, Minn., assignors to Alternative Pioneering Systems, Inc., Bloomington, Minn.

Filed Jun. 15, 1977, Ser. No. 806,774
Int. Cl.² A47G *23/04*
U.S. Cl. 34—225 **3 Claims**



1. Apparatus for removing the moisture content of foodstuffs in a controlled manner comprising in combination:

(a) an outer shell having at least three side walls, a top and a bottom, said shell defining an opening;

(b) a door member hingedly mounted and adapted to seal said opening when said door is in its closed position;

(c) an inner shell and a plurality of trays, said inner shell having two sides, a back, a top and a bottom disposed within said outer shell, the open front of said inner shell being juxtaposed to said opening in said outer shell, said two sides each having defined therein a plurality of horizontal rows of apertures spaced apart from one another by uniform predetermined distances, said apertures allowing the passage of air therethrough, said trays each including a rectangular frame with a lattice frame-work floor comprising intersecting ribs and a flexible screen removably supported within said frame;

(d) means on said two sides of said inner shell for supporting a plurality of trays in parallel, horizontal, spaced apart relationships, said trays being disposed intermediate said rows of apertures;

(e) means for supplying pressurized air to a zone defined by said outer shell and one of said two sides of said inner shell such that said air flows through the apertures in said one of said two sides, across said plurality of trays and through the apertures in the other of said two sides, said air supply means and the apertures of said one side being balanced so that air supply means provides sufficient pressure to assure uniform air flows through all of the apertures in said one side whereby each tray receives essentially the same volume of air across its upper and lower surfaces;

(f) means for recirculating at least a part of the air passing through said other of said two sides back to said means for supplying air under pressure; and

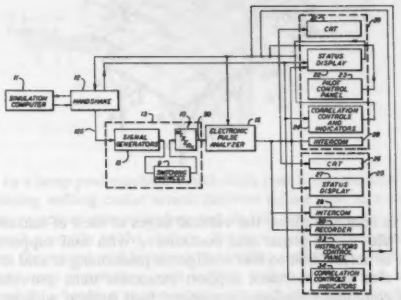
(g) vent means for controlling the amount of air entering from outside said outer shell, said entering air being subsequently mixed with said recirculated air.

4,192,082

ELECTRONIC WARFARE SIMULATOR

Ion V. Deaton, New Carrollton, and Frederick H. Horman, College Park, both of Md., assignors to The Singer Company, Binghamton, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,291
Int. Cl.² G09B *9/00*
U.S. Cl. 35—10.4 **6 Claims**



1. A radar warning simulation system that receives information regarding radar emitter characteristics from a digital computer said system comprising:

(a) a plurality of means for generating signals coupled to the output of said computer, each of said generating means being coupled to information that pertains to a different radar emitter so that each of said generating means will produce a train of video pulses at its output having a signal strength, antenna position, pulse width and pulse recurrence frequency equal to the corresponding radar emitter information characteristics; and

(b) a purality of switching matrices whose inputs are coupled to the outputs of said generators, each one of said switching matrixes being coupled to a different signal generator to permit each of said switching matrixes to select the antenna position and frequency band of said generators signals so that each one of said switching matrixes may select and output their output signals according to the antenna position and frequency of the input signals; and

(c) a plurality of means for mixing whose inputs are coupled to the outputs of said switching matrices, wherein said mixing means add like input signals and arrange the signals at their outputs according to the frequency and antenna position of the input signal, whereby the outputs of said mixing means activate an electronic pulse analyzer which stimulates electronic warfare equipment permitting a student to learn how to operate electronic warfare equipment.

4,192,083

THREE-DIMENSIONAL LAND-USE PLANNING MODEL

William G. Rebbeck, 4 Munn Ave., Cherry Hill, N.J. 08034

Filed Nov. 14, 1977, Ser. No. 851,501
Int. Cl.² G09B *29/02*
U.S. Cl. 35—16 **6 Claims**

1. A three-dimensional land-use display model and support comprising:

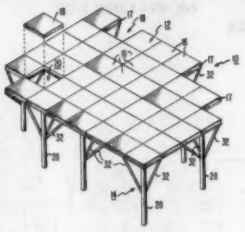
a plurality of rectangular modules having various three-dimensional surfaces representative of a contoured land surface;

a framework for supporting said modules, said framework

including means for removably and individually connecting said modules in assembled relation with aligned and contiguous corners and edges,

said framework comprising a plurality of modular structural units each providing a horizontal planar surface to support one of said modules incorporated into said display model, said module connecting means including means for connecting each of said units to contiguous units whereby said framework is incrementally expandible;

each of said modules including a horizontal planar undersurface, and said structural units including coextensive planar surfaces for supporting said module horizontal surfaces in



a common plane; the vertical edges of each of said modules being planar and coextensive with said supporting structural unit so that contiguous positioning of said modules and associated support structural units provides a continuous similated contoured land surface without interstitial gaps, and individual modules are attached and removed without dislocation of adjacent modules;

each of said modular structural units comprising an open rectangular frame supporting the associated one of said rectangular modules at the outer edges thereof;

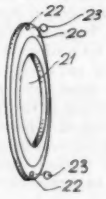
whereby a continuous land-use display model is formed by the assembled modules.

4,192,084

ATOMIC MODEL

Seán S. O'Riordán, Long La., Dublin Hill, Cork, Ireland

Filed Sep. 11, 1975, Ser. No. 612,581
Claims priority, application Ireland, Sep. 17, 1974, 1923/74
Int. Cl.[2] G09B *23/26*
U.S. Cl. 35—18 A **2 Claims**



1. A teaching aid comprising:

a display board;

a circular disc having a symbol printed thereon;

means for attaching said disc to said board;

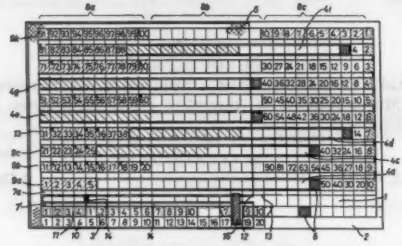
said display board and said disc being comprised of magnetic material, said circular disc being held to said display board by magnetic means, said disc having a chemical symbol printed thereon; at least one ring held on said disc and surrounding said disc, said ring having a cut-out embracing said circular disc, said ring having a concentric circle printed thereon and having holes, pins inserted into said holes for denoting electrons in orbit, said disc comprising a magnet and cooperating with said ring for displaying possible chemical structures of compounds, said ring displaying electrons in orbit about said disc, said disc corresponding to the nucleus of an atom.

4,192,085

TEACHING AID DEVICE FOR TEACHING THE BASIC PRINCIPLES OF ARITHMETIC

Simon Bonorand, Zuoz, Switzerland, assignor to Guido Caviezel, Chur, Switzerland

Filed Feb. 21, 1978, Ser. No. 879,245
Claims priority, application Switzerland, Feb. 25, 1977, 2436/77
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 E **11 Claims**



1. A device for teaching the basic concepts of arithmetic, comprising:

a tablet having two faces;

a plurality of adjoining regions defined on one of said faces;

a plurality of fields defined within each of two edge regions located most remotely on opposite sides of said one face;

a plurality of regular rows composed of said fields defined within each of said edge regions;

a first set of consecutive numbers displayed in said rows of one of said edge regions, said first set of numbers being arranged to permit selective demonstration of addition and subtraction and the sequential position thereof;

a second set of numbers displayed in said rows in the other of said edge regions, said second set of numbers being arranged to indicate a product of one number selected from a first array of numbers and of another number selected from a second array of numbers;

a plurality of guide members, each of said guide members being disposed between adjacent ones of said rows;

a plurality of slides, each of said slides being associated with one of said rows, each of said slides being loosely guided on said face between two of said guide members disposed on either side of an associated row, and each of said slides being slidable along an associated row between a first section thereof in said one of said edge regions and a second section thereof disposed at the same level as said first section in said other of said edge regions, at least a portion of one or the other of said first section or said second section being covered by an associated one of said slides to expose at a corresponding end of said associated one of said slides a result of an arithmetic operation carried out in one or the other of said edge regions.

4,192,086

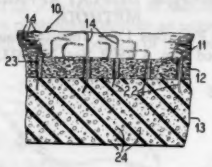
DEODORIZING INSOLE

Stephen Sichak, Dolton, Ill., assignor to Scholl, Inc., Chicago, Ill.

Filed Sep. 29, 1978, Ser. No. 947,156
Int. Cl.[2] A43B *13/38, 7/06*
U.S. Cl. 36—44 **14 Claims**

1. An insole which comprises a porous top layer of non-woven non-absorbing plastics material fibers, an intermediate layer of moisture absorbing non-woven material impregnated

with an odor absorbing chemical, and a bottom open-cell resilient plastics material foam layer, said top layer having fibers thereof penetrating the paper stitch bonding together the top and intermediate layers and having ends surrounded by



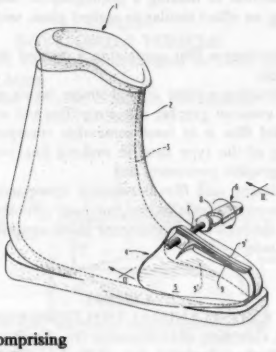
and integrally bonded in the foam layer, and said insole having a myriad of holes therethrough exposing the chemical of the intermediate layer to air flow through the insole as the foam layer is flattened and expanded by application and release of foot load on the insole.

4,192,087

SKI BOOT WITH FOOT-RETENTION DEVICE

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Feb. 22, 1978, Ser. No. 879,997
Claims priority, application France, Feb. 23, 1977, 77 05264
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—119 **16 Claims**



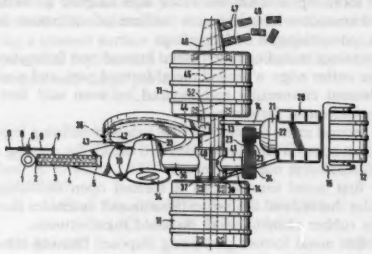
1. A boot comprising
(a) a rigid shell;
(b) a foot retention system mounted on the interior of the shell in the area of the forefoot, said foot retention system comprising
(i) a support means, independent of the sole of the boot and having a generally V-shape, comprising two side plates extending laterally and upon the upper part of the forefoot, having a shape corresponding substantially to the anatomy of said forefoot at its widest point; and
(ii) an adjustable means for clamping said support means against a foot within said boot, comprising means for simultaneously moving said two side plates and pressing them against said foot while adapting them to the anatomy of the upper part of the forefoot, said clamping means being supported on said shell in such manner that said foot is clamped against the inner sole of said boot and is laterally maintained by said support means.

4,192,088

LUMP PEAT MACHINE

Tapio Saalasti, Helsinki, Finland, assignor to Kemi Oy, Kemi, Finland

Filed Mar. 2, 1978, Ser. No. 882,590
Claims priority, application Finland, Mar. 3, 1977, 770679
Int. Cl.[2] E21C *49/00*
U.S. Cl. 37—3 **21 Claims**



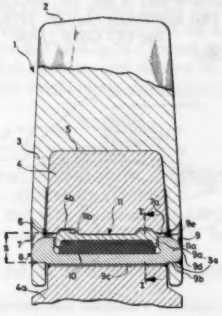
1. In a lump peat machine which mills peat from peatland by a rotating milling cutter which delivers milled peat to a tube having a screw conveyor disposed therein to express the peat through a nozzle to the surface, the improvement comprising means for raising and lowering the milling cutter comprising a hollow arm supporting said milling cutter at one end and affixed to a bearing at the other end, said bearing encircling said tube and being adapted to permit raising or lowering of said milling cutter between working and transport positions and means within said hollow arm to transmit power to said milling cutter.

4,192,089

RETAINER FOR RELEASABLY SECURING A TOOTH TIP OF A DIGGER TOOTH

Dieter Schwappach, Dortmund, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,241
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713227
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—142 A **7 Claims**



1. A retainer for the releaseable securing of a tooth tip of a digger tooth on a holder, the tooth tip having a sleeve, and the holder engaging in the sleeve and being rigidly connected with the digging edge of a shovel bucket, holder being formed with a holder opening extending parallel to the cutter edge of the tooth tip and in the longitudinal center line of the tooth, the tooth tip having tooth surfaces defining tooth tip openings

substantially aligned with said holder opening, said tooth surfaces including first surfaces facing toward said cutter edge, said holder being formed with recess surfaces defining a recess in the holder, said recess surfaces facing away from the cutter edge, said retainer being inserted in said tooth tip and holder openings and comprising two metal formed parts and a rubber element arranged between said two metal formed parts, said rubber element being stressed on compression, said retainer in the inserted position on one side contacting said first surfaces of the tooth tip, and on the other side adapted to be urged toward contact with said recess surfaces of said recess in the holder, comprising in said openings

the retainer including a first metal formed part facing toward the cutter edge, a second metal formed part, and a rubber element connecting and secured between said first and second metal formed parts,

said second metal formed part is U-shaped defining legs and being open on elongated sides and facing the digging edge of the shovel bucket,

said first metal formed part is formed open an elongated sides thereof and has projections on end face sides thereof, the rubber element being disposed therebetween,

said first metal formed part being disposed floating between said legs of the U-shaped said second metal formed part,

the tooth tip openings constituting sleeve openings in the sleeve of the tooth tip and the tooth surfaces further defining an inner wall of the sleeve openings,

said legs of said second metal formed part have face surfaces facing said cutter edge,

said face surfaces of said second metal formed part being spaced from said inner wall of said sleeve defining a gap therebetween,

the size of said gap between the face surfaces of said legs of said second metal formed part and said inner wall at the sleeve openings is smaller than the permissible amount of additional compression of said rubber element beyond that existing in the inserted position of the retainer in the tooth tip and holder openings for maintaining the endurance of said rubber element, whereby said rubber element connecting said two metal formed parts is protected against stress exceeding its fatigue strength,

said first metal formed part having an outer surface forming cam means for securing the retainer against falling out from the tooth tip and holder openings in the inserted position during stressing of the tooth tip.

4,192,090

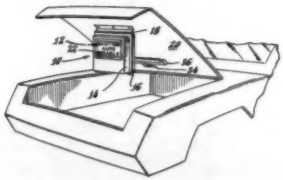
VEHICLE SAFETY LIGHT

Marion Seth, 902 E. 17th St., Wilmington, Del. 19802

Continuation-in-part of Ser. No. 804,325, Jun. 7, 1977, abandoned. This application May 30, 1978, Ser. No. 910,613

Int. Cl.[2] G09F *21/04*

U.S. Cl. 40—591 **3 Claims**



1. A safety light for a disabled automobile vehicle comprising a translucent sign positioned within a frame, a light and suitable power supply for illuminating said sign bracket, means to removably secure said frame to the interior surface of the trunk lid of said vehicle and means for removing said frame from said vehicle, means for securing said frame to an exterior surface of the vehicle when said frame is removed from said bracket, said translucent sign having a warning legend thereon in letters at least two (2) inches high and at least one-half (½) inch in thickness, whereby when said safety light is placed near said disabled vehicle and illuminated, the warning legend is visible from a distance of at least 65 feet.

4,192,091

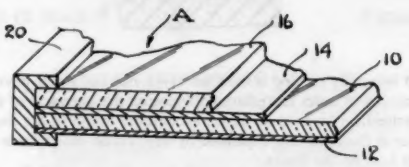
PHOTOGRAPHIC DISPLAY APPARATUS AND METHOD

Michael Hawes, P.O. Box 1282, Topanga Canyon, Calif. 90290

Filed Aug. 4, 1978, Ser. No. 931,197

Int. Cl.[2] G09F *19/16*

U.S. Cl. 40—615 **13 Claims**



1. A photographic display apparatus presenting an effect similar to etched glass, said display apparatus comprising:

(a) a substrate having a mirrored surface thereon,

(b) an orthochromatic high contrast graphic arts copy film sheet of the type used in making line reproductions in lithographic processes, said film sheet having a visual image thereon incidental to a surface of said substrate,

(c) a transparent sheet incidental to said ortho film sheet such that the film sheet is disposed between said substrate and transparent sheet so that one may view the image on said film sheet through said transparent sheet against said mirrored surface, and

(d) means to hold said substrate and transparent sheet in incidental relationship to said film sheet.

7. A method of making a photographic display apparatus presenting an effect similar to etched glass, said method comprising:

(a) generating a film containing a desired image to be displayed,

(b) generating a print of said image on an orthochromatic high contrast graphic arts copy film and where a portion of said film is at least somewhat transparent, said film being of the type used in making line reproductions in lithographic processes, and

(c) enclosing said film between a transparent sheet and a mirrored substrate so that one may view the image on the film through the transparent sheet against the mirrored substrate.

4,192,092

TOY EATING ANIMAL UTILIZING CONVEYOR

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356; Erwin Benkoe, deceased, late of Encino, Calif.; by Elisabeth Benkoe, Executrix, 17965 Medley Dr., Encino, Calif. 91316, and Elonne Dantzer, Redondo Beach, Calif., assignors to Adolph E. Goldfarb and Elisabeth Benkoe, Executrix for Estate of Erwin Benkoe, both of Northridge, Calif.

Filed Feb. 10, 1978, Ser. No. 876,657

Int. Cl.[2] A63H *13/02*

U.S. Cl. 46—123 **5 Claims**

1. A toy animal figure apparatus capable of taking in simulated food articles in a manner simulating the eating of such articles, said apparatus comprising:

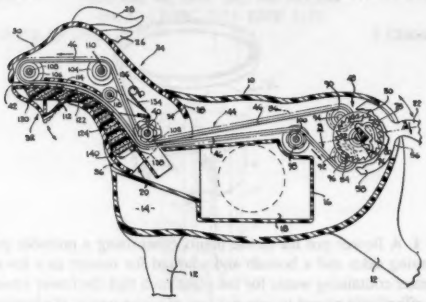
(a) a body section,

(b) a head portion on said body section and an opening representative of a mouth on said head portion,

(c) endless movable conveyor means adapted for continuous movement in one direction in a continuous path during operation for mechanically conveying solid or relatively solid toy food articles of various sizes and shapes which

are introduced at said mouth and through the head section, thereby simulating the eating of the articles by said animal figure apparatus, and

(d) manually operable actuating means on said animal figure apparatus to cause movement of said conveying means and the conveying of the articles from said mouth and through said head section, said head portion being pivotally mounted on a forward end of said body section and being capable of shifting between an upper position and a lower position so that a portion of that path of movement



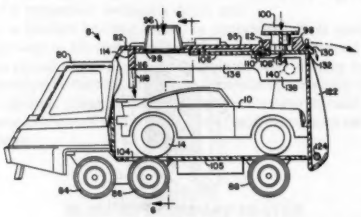
of the articles may be upward or partially upward, and where said head can be stationarily maintained in the upper position or the lower position or maintained in at least one selected stationary position between the upper and lower positions during the conveying of the food articles, said apparatus also including a jaw portion pivotally mounted on said head portion, and means operatively connected to said conveyor means and said jaw portion to cause a shiftable movement of said jaw portion to simulate a chewing action.

4,192,093

TOY CARRIER VEHICLE

Nobuo Hamano, Toyko, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 20, 1978, Ser. No. 962,020
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—204 **7 Claims**



1. An unpowered toy carrier vehicle for use with a powered toy vehicle, said powered toy vehicle being of the type which can be energized by exerting force on the top of the vehicle and rotating the drive wheels thereof, comprising:

a toy vehicle having a cargo portion sufficiently large to accommodate said powered toy vehicle, said cargo portion having a floor with two openings therein and a top with a first opening therein;

two drive wheels, each of said drive wheels being mounted for rotation beneath the openings in the floor of said cargo portion;

means for allowing said powered toy vehicle to be inserted into said cargo portion and positioned with its drive wheels communicating with said drive wheels mounted beneath the openings in the floor of said cargo portion; and

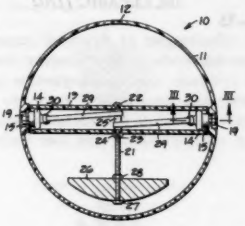
means for exerting force on the top of said powered vehicle when it is within said cargo portion, said means for exerting force on the top of said powered toy vehicle comprising an elongated resilient member mounted within said cargo portion on the top thereof, at least one cargo depression member fixedly attached to said elongated resilient member and extending through the first opening in said top of said cargo portion, and an end member fixedly mounted to said resilient member, said end member having a contact surface configured to engage the top of said powered toy vehicle when said powered toy vehicle is within said cargo portion.

4,192,094

SELF-PROPELLING TOY

Michael K. Johnson, 5314 Franklin Ave. - #7, Los Angeles, Calif. 90027

Filed Jun. 19, 1978, Ser. No. 916,798
Int. Cl.[2] A63H *17/00, 29/08*
U.S. Cl. 46—207 **15 Claims**



1. A self-propelling toy comprising

a housing,

a tubular support member rotatably mounted within said housing,

roller means for rotatably mounting each end of said support member on said housing and disposed within said support member,

weight means secured to said support member and spaced therefrom at a predetermined distance, and

drive means interconnected between said housing and said support member for storing-up energy therein when said support member and said weight means are rotated in one direction relative to said housing and for releasing such energy to rotate said housing in a second direction opposite to said first direction and relative to said support member and said weight means upon release of said toy on the ground.

4,192,095

SEED TREATING SUSPENSION AND METHOD OF SEED TREATMENT

Lester H. Haslam, Box 1121, Twin Falls, Id. 83301; Jay Woods, and Verle W. Woods, both of P.O. 1016, Yakima, Wash. 98901

Filed Jul. 31, 1978, Ser. No. 929,819
Int. Cl.[2] A01C *1/06*
U.S. Cl. 47—58 **10 Claims**

1. A method for treating crop seeds to produce coated seeds having increased weight, comprising the following steps:

forming an oleaginous suspension of an inert, solid water insoluble inorganic particulate material having a density of at least 2.7 grams per cubic centimeter in a discontinuous oil phase dispersed in a continuous water phase, the weight of the inorganic particulate material constituting

75% to 90% of the total weight of the oil phase, including the inorganic particulate material and the weight of the oil phase including the inorganic particulate material constituting 20% to 30% of the total suspension by weight.

mixing the suspension and seeds so as to apply the suspension onto the surfaces of the seeds;

and permitting the coated seeds to cure during absorption of the suspension components, whereby the suspension remaining on the seed surfaces inverts.

4,192,096

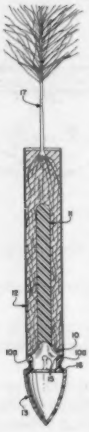
PLANT CONTAINER FOR GROWING PLANTS WHICH ARE TO BE TRANSPLANTED

John R. Platt, Wheaton, and William N. Weaver, Northbrook, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 779,446, Mar. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 741,631, Nov. 15, 1976, abandoned. This application Mar. 1, 1978, Ser. No. 882,490

Int. Cl.[2] A01C *11/02*

U.S. Cl. 47—73 **12 Claims**



1. A plant container for growing a plant to a stage suitable for transplanting, said container comprising a base forming the bottom wall of said container and a circumferentially unsupported, discrete sleeve forming the sidewall of said container, said base having a substantially circular periphery and an upper surface being upwardly domed within said periphery which is devoid of any openings capable of passing water therethrough, a rib means for retaining growing medium and root mass thereabout when the sleeve is removed, said rib means located on said upper surface of said base and upstanding therefrom at the apex of the domed surface thereof, said sleeve formed of a thin flexible plastics material in the shape of a tube substantially open at both ends thereof and having an axial extent greater than the axial extent of the rib means, said sleeve disposed concentrically about said rib means with the lower edge of said sleeve cooperating with the base, said base including abutment means adjacent the outer periphery thereof and cooperating with the lower edge of the sleeve to form spaces between the base and the sleeve to permit water to drain from between said periphery and the lower edge of said sleeve, whereby said base absent said sleeve with the growing medium and root mass of a plant grown in said container and about said rib is capable of being transplanted as a unit.

4,192,097

HORTICULTURAL IMPROVEMENTS

Walton J. Smith, P.O. Box 461, Wilton, Conn. 06897

Continuation of Ser. No. 811,315, Jun. 29, 1977, abandoned, which is a continuation of Ser. No. 715,503, Aug. 18, 1976, abandoned, which is a continuation of Ser. No. 571,866, Apr. 25, 1975, abandoned. This application Jun. 7, 1978, Ser. No. 913,445 The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.

Int. Cl.[2] A01G *31/00*

U.S. Cl. 47—59 **1 Claim**

1. A flower pot for house plants comprising a portable pot having sides and a bottom and adapted for receipt in a lower vessel containing water for the plant such that the lower vessel is effectively closed to prevent loss of water vapor, the bottom of said pot including support means comprising crossing reinforcing ribs supporting a section of a removable aluminum window screen, said bottom being at least 34% open and holding fine particulate plant-supporting material, the particles of which are finer than the screen openings at least directly on said screen and accomodating a substantial root system, said screen having openings at least 1/36" and smaller than about ⅛" in the largest dimensions.

4,192,098

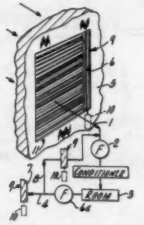
AIR DAMPER APPARATUS PARTICULARLY FOR HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS

Donald E. Brzezinski, Brookfield, Wis., assignor to Johnson Controls Inc., Milwaukee, Wis.

Filed Jun. 12, 1978, Ser. No. 914,961

Int. Cl.[2] E06B *7/086*

U.S. Cl. 49—91 **20 Claims**



1. An air damper apparatus, comprising a frame structure having spaced support means, a plurality of substantially parallel closure blade means pivotally mounted to said spaced support means, said blade means having planar end edges, a plurality of individual end seal units located in end-to-end relationship to conjointly define an essentially continuous sealing surface including said individual end seal units aligned one each with each of said blade means, and mounting means for each seal unit locating each of the seal units between the support means and at least one end of said blades and including means to individually urge the seal units outwardly into sliding

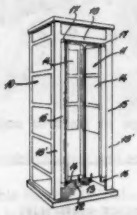
sealing engagement with the planar edge of each of the aligned blade means and sealing the edge against the flow thereby.

4,192,099

SWINGING DOOR STRUCTURES FOR EXTERIOR TELEPHONE BOOTHS

Paul Simko, Montreal, and Albert Strasser, Coteau du Lac, both of Canada, assignors to Brass & Bronze Mfg. Co. Ltd., St. Laurent, Canada

Filed Jul. 24, 1978, Ser. No. 927,510
Int. Cl.[2] E05C 7/04; E05F 1/10
U.S. Cl. 49—366 **9 Claims**



1. A swinging door assembly particularly, but not exclusively, for securement in a door opening of an exterior telephone booth, comprising:

(i) a lintel member having a pair of top pivot housings and securable to a top horizontal frame of said door opening, each said top pivot housing lying at a respective end of said top horizontal frame,

(ii) a pivot clamp bracket securable to a respective lower portion of opposed vertical frames of said door opening,

(iii) a pair of swinging doors each having a door column in a longitudinal vertical edge thereof;

(iv) each door column having a torsion bar therein, said torsion bar being fixed at a lower end in a bearing bushing housing and having an upper securable extension portion protruding above a top end of said column,

(v) each upper securable extension portion of said torsion bars being immovably secured in a respective one of said pivot housings,

(vi) said pivot clamp bracket having a pivot pin receivable in a pivot hole in a lower end of said bearing bushing housing of a respective swinging door, and

(vii) a friction bearing assembly supported about said pivot pin and in frictional engagement with a peripheral lower marginal edge of said pivot hole of said bearing bushing housing to frictionally retain a respective swinging door in a desired plane determined by the fixation of said extension portion of said torsion bar of said respective swinging door.

4,192,100

SLIDING DOOR APPARATUS

Kenneth G. Klema, 2209 - 4½ Mile Rd., Racine, Wis. 53402

Filed Nov. 21, 1977, Ser. No. 853,552
Int. Cl.[2] E05D 15/26, 15/06
U.S. Cl. 49—404 **12 Claims**

1. Sliding door apparatus for closing an opening in a building structure, comprising:

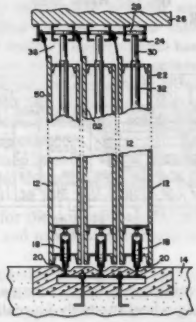
a frame on said structure defining said opening;

at least one sliding door engaged with said structure and having an edge aligned substantially parallel to a portion of said frame, said edge and said frame portion constituting relatively moveable, adjacent members defining a gap therebetween;

rods extending from one of said adjacent members, spanning said gap, and terminating in distal ends engaged in guides on the other of said adjacent members, said rods being axially slidable with respect to at least one of said adjacent members to accommodate changing gap dimensions while engaging said guides;

a magnetically receptive surface on one of said adjacent members and extending along said gap;

a flexible sealing strip attached to the other of said adjacent members along said gap and spanning said gap and having



magnetic means therewith to magnetically engage said strip with said receptive surface when said door is closed;

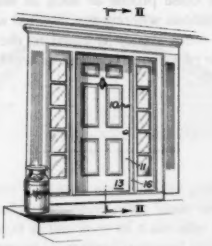
means causing convergence of said receptive surface and said strip at one set of their adjacent ends when said door is substantially closed thereby to initiate a magnetic wave action to close said gap in substantially weather-tight fashion.

4,192,101

DOOR SEALING APPARATUS

William G. White, 12 Winthrop La., Holden, Mass. 01520

Filed Jun. 23, 1978, Ser. No. 918,383
Int. Cl.[2] E06B 7/16
U.S. Cl. 49—478 **4 Claims**



1. Apparatus for sealing a door against leakage comprising:

(a) a first thin metal strip extending around the periphery of the door on the face surface,

(b) a first sealing strip mounted around the frame, including a base portion attached to the frame, a resilient collapsible portion extending from the base portion, and a magnetic portion extending from the collapsible portion,

(c) a second metal strip mounted on the threshold including an inclined surface that faces in the direction of the opening of the door, and

(d) a second sealing strip having a base portion attached to the face of the door adjacent the bottom edge, a resilient collapsible portion extending from the base portion, and a magnetic portion extending from the collapsible portion, said magnetic portion having a contact surface that is generally parallel to the inclined surface of the second metal strip.

4,192,102

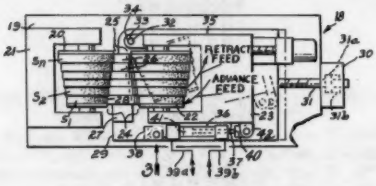
CENTERLESS PLUNGE GRINDING MACHINE WITH PROGRESSIVE ANGLE DEVELOPMENT

Wilbur F. Jessup, The Hague, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 803,569, Jun. 6, 1977, Pat. No. 4,107,881. This application Jul. 14, 1978, Ser. No. 924,846

Int. Cl.[2] B24B *5/32*

U.S. Cl. 51—103 R **3 Claims**



1. An improved centerless grinder having a base, a grinding wheel and regulating wheel rotatably journalled in respective grinding and regulating wheelheads carried by said base, said wheels disposed to one another so as to form an inlet end and outlet end between said wheels, and a work support located between said wheels for supporting a workpiece of revolution, wherein the improvement comprises:

(a) a plurality of work stations defined along the faces of said wheels comprising a like plurality of frusto-conical wheel segments on each wheel with bases disposed toward said outlet end and the included angle of the wheel segments progressively decreases from the segment proximal the inlet end to the segment proximal the outlet end on each of said wheels, respectively; and

(b) means for effectuating relative movement between said regulating wheel and said grinding wheel about said outlet end during the grinding process between a first beginning position and a second, finished position thereby establishing a work cone profile at each of said beginning and finished positions wherein the finished work cone profile of a given work station is equal to the beginning work cone profile of the next successive work station.

4,192,103

CUTTING REEL GRINDER WITH AUTOMATIC CONTROL

Eugene A. Sousek, Appleton, Wis., assignor to Koehring Company, Brookfield, Wis.

Filed Aug. 22, 1978, Ser. No. 935,984

Int. Cl.[2] B24B *19/00*

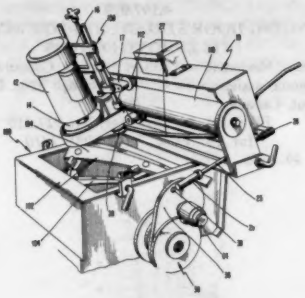
U.S. Cl. 51—249 **18 Claims**

1. An automatic sharpening unit for a cutting reel of the type having a plurality of helical knives, comprising:

grinding means operable to grind the edge of a helical knife and having a translatable carriage and a first electrical actuator to move the carriage;

indexing means for connection to a cutting reel, having a second electrical actuator operable to rotate a cutting reel through a predetermined angle that is integrally divisible into 360°; and

electrical control means connected with the first and second actuators for regulating the grinding means and the indexing means, operable to drive the indexing means through the predetermined angle and to subsequently cause the



translatable carriage to traverse and sharpen a helical knife.

4,192,104

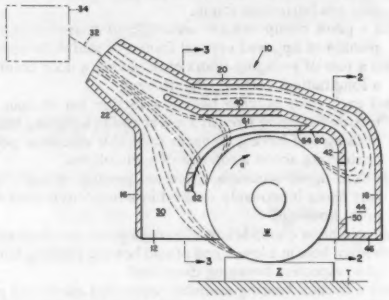
DUST SHROUD

James K. Patenaude, Easthampton, Mass., assignor to Wilderness Mold, Inc., Northampton, Mass.

Filed Oct. 10, 1978, Ser. No. 949,883

Int. Cl.[2] B24B *55/06*

U.S. Cl. 51—273 **1 Claim**



1. In an exhaust system for a rotating abrading component of an abrading machine, the combination of:

a vacuum source, a shroud connected to the vacuum source and mounted on the abrading machine circumadjacent the major portion of the abrading component and having an opening in the bottom thereof through which the minor portion of the abrading component extends for operation on a workpiece,

a secondary wall within the shroud for separating the shroud interior into a primary vacuum channel adjacent the ascending portion of the abrading component and a secondary vacuum channel adjacent the descending portion of the abrading component,

an entrance opening in the secondary wall in line with the descending portion of the abrading component and communicating with the secondary vacuum channel,

the entrance opening in the secondary wall being slightly narrower than the width of the abrading component,

a tertiary wall within the shroud and spaced from and conforming to the curvature of the abrading component and having an entrance opening in line with the ascending portion of the abrading component and communicating with the primary vacuum channel,

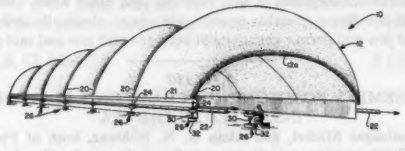
the entrance opening in the tertiary wall being of a width much more narrow than the width of the abrading component and than the width of the entrance opening in the secondary wall.

4,192,105

INFLATABLE BUILDING AND ANCHOR MEANS FOR PIPELINE CONSTRUCTION

Burton D. Morgan, Hudson, Ohio, assignor to Concept Development Institute, Inc., Hudson, Ohio

Filed May 8, 1978, Ser. No. 903,459
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—2 **8 Claims**



1. A portable inflatable shelter and attaching means therefor comprising

an inflatable flexible structure of elongate shape and having open ends, and being of arcuate shape in vertical section,

track means at each side of said structure and extending substantially the length thereof and being operatively secured to said structure, and

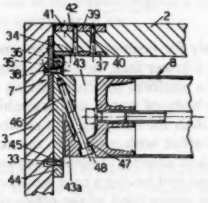
a plurality of movable anchor means each including pivotal devices to engage said track means at spaced portions thereof and hold said structure against vertical upward movement but permitting relative movement between said devices and said track whereby said structure can be operatively positioned by said anchor means but be movable in relation thereto.

4,192,106

MODULAR ELEMENTS FOR COMPOSING DISASSEMBLABLE WALLS, CABINETS, WRITING-DESKS OR OTHER PIECES OF FURNITURE

Hans Hell, Kassel, Fed. Rep. of Germany, assignor to Anonima Castelli S.p.A., Italy

Filed May 4, 1978, Ser. No. 902,987
Claims priority, application Italy, Jun. 24, 1977, 49978 A/77
Int. Cl.[2] A47G *29/02*; A47H *5/00*
U.S. Cl. 52—36 **5 Claims**



1. Modular elements for composing walls, cabinets, writing tables and other pieces of furniture of a disassemblable type characterized by the fact that they comprise:

a kit including the following components;

panels of various standard sizes;

box-like metal sections designed to be applied to at least a pair of the opposite edges of said panels and provided on each of three surfaces thereof with a single longitudinal groove having a longitudinal slot access thereto of a width smaller than that of each of the grooves, while from the remaining fourth surface and designed to come into contact with the panel side anchoring means extend outwardly from the section so said anchoring means can connect the said section to the panel;

column devices to form a joining and pivoting connection for the panels, each having, at its ends, pieces adapted to be received inside the central longitudinal grooves of said sections, entering through the open end orifices thereof and cooperating with means locking said pieces in their engaged position, said column devices being covered by an elastically deformable material and housing in the inside a hollow tubular member into which passes a threaded rod having a upper control head and which at its lower end rests on an adjustable ground engaging foot;

cylindrical rods for the connection of wall panels, end by end in coplanar relationship, and provided with end pieces adapted to be received inside pairs of the central grooves of adjacent sections;

expansion locking screws to be inserted into the front grooves of the sections for carrying hooks, beams and the like;

hinge devices for the connection of adjacent wall panels at right angles and to allow said panels to be folded one on the other;

through rods passing through the vertical panels from the top to the bottom within the thickness thereof and provided with an upper control head and with a lower adjustable ground engaging foot; and

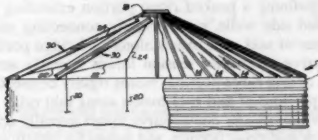
bars having shaped end portions, acting as spacers between two parallel panels, said end portions being so shaped as to be received in seats arranged in shaped plates fixedly connected to the inner surfaces of said opposite wall panels and provided with through holes to receive safety locking screws.

4,192,107

CONICAL ROOF STRUCTURE

Lawrence L. Wickstrom, and Jock C. Garden, both of Hutchinson, Kans., assignors to Farmland Industries, Inc., Kansas City, Mo.

Filed May 30, 1978, Ser. No. 910,873
Int. Cl.[2] E04B *7/00*
U.S. Cl. 52—82 **11 Claims**



1. A conical roof assembly structure for grain bins required to support randomly positioned cable loads including:

a primary support in the form of a circular wall;

a secondary support in vertically spaced concentric relation to the primary support;

a plurality of tapered roof panels radially arranged, the longitudinal side edges of each roof panel being shaped in an inverted u-shaped rib, the u-shaped rib of each adjacent roof panel overlapping the rib of the adjacent panel, the upper ends of the roof panels being secured to the secondary support while the lower ends are secured to the primary support forming a conical structure;

a plurality of longitudinal stiffener members each having a web with an upper and lower flange extending from the opposite ends of the web, said stiffener members being radially spaced under the rib of one or more roof panels, the web of each stiffener member being vertically positioned and having a greater dimension than both upper and lower flanges;

fastening means along the ribs of the roof panels passing through the overlapping ribs of the adjacent roof panels and the upper flange of the stiffener member forming a

rigid structure for support of bending and compression loads;

wherein the improvement comprises:

cable suspension means attached approximate each end of each stiffener member to a common load mounting point therebetween for supporting vertical cable loads whereby the tensile loads on the cable suspension means cause its associated stiffener member to act in compression.

4,192,108

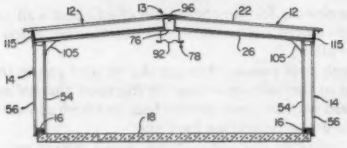
FRAMELESS METAL BUILDING

Colin F. Lowe, P.O. Box 128, Hutsonville, Ill. 62433

Continuation-in-part of Ser. No. 831,781, Sep. 9, 1977, Pat. No. 4,106,245. This application Jun. 1, 1978, Ser. No. 911,378

Int. Cl.[2] E04B *7/02*

U.S. Cl. 52—90 **24 Claims**



1. A frameless building comprising a plurality of generally rectangular roof panels, each of said roof panels including an inner sheet metal skin portion and an outer sheet metal skin portion, each said skin portion having a corrugated cross-sectional configuration, a series of spacers rigidly connected to said skin portions of each said roof panel, means forming spaced opposite side walls for said building, said roof panels being secured together in adjacent relation to form a roof assembly extending between said opposite side walls, said spacers within each said roof panel including tapering longitudinal spacers positioning said inner skin portion substantially horizontally to provide said roof assembly with a substantially flat inner ceiling, said outer skin portions being inclined upwardly from said side walls at an angle less than twelve degrees and defining a peaked ridge portion extending parallel between said side walls, means rigidly connecting said inner skin portions of said roof panels along said ridge portion and being effective to transfer tension forces laterally across the lower part of said ridge portion, means rigidly connecting said outer skin portions of said roof panels along said ridge portion and effective to transfer compressive forces laterally across the upper part of said ridge portion, and means for rigidly connecting said roof panels to said side walls for transferring loads from said roof panels through said side walls to a base supporting said side walls.

4,192,109

COMPONENTS OF RETRACTABLE BEAMS, AND ASSEMBLIES THEREOF

Angelo Caffa; Letizia Caffa, and Carla Caffa, all of Corso Francia 30, Turin, Italy

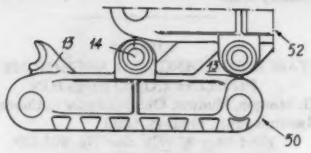
Filed Jan. 19, 1978, Ser. No. 870,831

Claims priority, application Italy, Jan. 26, 1977, 19642 A/77

Int. Cl.[2] E04B *1/346*

U.S. Cl. 52—108 **3 Claims**

1. A retractable beam comprising a pair of beam chains each including a plurality of component elements pivotally mounted to each other, each component element including interlocking joint means extending therefrom, said pair of beam chains being juxtaposable with each other causing said interlocking joint means of said component elements of said pair of beam chains to interlock with each other forming a rigid beam structure, said interlocking joint means comprising at least one jaw extending from at least one of said component element on one of said beam chains, said jaw being slightly elastically and resiliently movable with respect to said one component element, and a pin connected to at least one of said component elements on said other of said beam chains engageable with



said jaw to form a substantially rigid connection between said component elements of said one and said other beam chains, said jaw being abutable against said pin to elastically deform said jaw and permit engagement between said jaw and said pin.

4,192,110

ASSEMBLY POSITIONING A CRANE ON A PLATFORM INSTALLED IN THE SEA

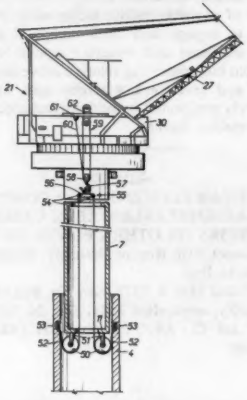
Dominique Michel, and Alain G. N. Noblanc, both of Paris, France, assignors to Compagnie Generale pour les Developpements, Operationnels des Richesses Sous-Marines, "C. G. Doris," Paris, France

Filed Oct. 12, 1977, Ser. No. 841,372

Claims priority, application France, Oct. 12, 1976, 76 30587

Int. Cl.[2] E04H *12/34*

U.S. Cl. 52—111 **2 Claims**



2. An assembly for positioning a crane mounted on a crane support having a lower face, said crane intended to overhang the platform of a platform structure having a base which rests on the bed of a body of water, said assembly comprising:

(a) a central shaft for carrying said platform,

(b) a column offset with respect to the central shaft,

(c) a mobile shaft element contained in the upper part of said offset column and having a base means effective to emerge as far as the upper level of the offset column,

(d) a downwardly extending shaft element fixed on the lower face of the crane support,

(e) said shaft element having the same diameter as the mobile shaft element,

(f) the two shaft elements being substantially coaxial when the platform is carried on the central shaft,

(g) a block and tackle having a cable and being suspended to the crane support,

(h) one of the ends of the block and tackle cable being fixed to the crane support,

(i) pulleys disposed on the base means of said mobile shaft element, and

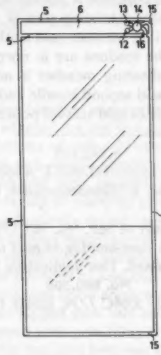
(j) a cable passing over each said pulley and having one end

thereof attached to the wall of the offset column, near to its upper edge, and the other end thereof attached to a central ring including means for connection to the block and tackle.

4,192,111
WINDOWS

Lars A. Ekstrom, Djursholm, Sweden, assignor to Raywall Kommanditbolag, Marsta, Sweden

Filed May 23, 1978, Ser. No. 908,648
Claims priority, application Sweden, May 23, 1977, 7705999
Int. Cl.[2] E06B *7/12*
U.S. Cl. 52—171 **5 Claims**



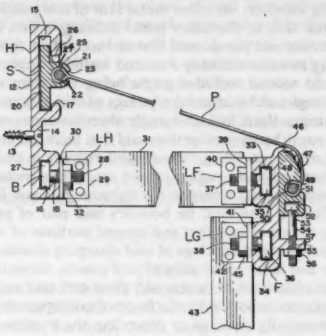
1. A window comprising a frame, at least two transparent panes supported by and mounted within said frame in parallel relationship, said panes being separated from one another and defining a space between them, a slab of heat insulation material located in said space and having a width corresponding substantially to the width of the panes and a length less than the length of the panes, said slab being movable along the length of the panes, and control means located at each end of the length of the panes in said frame for supplying and receiving air to the space between the panes in a controlled manner whereby the slab can be selectively moved a distance along the length of panes by a current of air.

4,192,112
PLIABLE AWNING SYSTEM

Robert M. Reilly, Sr., 810 Barry St., Miami Beach, Fla. 33140

Filed Sep. 28, 1978, Ser. No. 946,764
Int. Cl.[2] E04B *1/12*
U.S. Cl. 52—222 **9 Claims**

1. An awning system comprising head bar means adapted to be secured to a building, front bar means adapted to be supported in space relation to said head bar means, a pliable awning extending between said head bar means and said front bar means, adjustable means mounted on said front bar means maintaining said pliable awning in a taut condition, said head bar means comprising a longitudinally disposed slotted portion having an opening, and awning securing member slidably mounted in said slotted portion and extending through said opening, pliable securing means mounted in said opening and engaging said awning securing member whereby upon removal of said pliable securing means, said awning securing

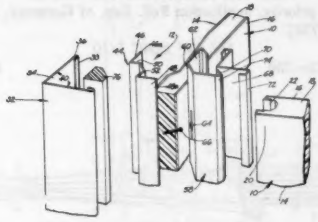


member may be removed from said slotted portion through said opening.

4,192,113
CORNER ASSEMBLY FOR WALL PANELS

Mulford Martin, Jr., Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio

Continuation-in-part of Ser. No. 810,310, Jun. 27, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,351
Int. Cl.[2] E04B *2/58*
U.S. Cl. 52—282 **31 Claims**



1. In a corner and sealing assembly for the corner of a building of the type having a pair of panels angularly disposed in edge-to-edge relationship, each panel comprising an outer metal skin and an inner metal skin separated by and joined to an intermediate insulating body substantially filling the space between said skins, an exterior trim piece of V-shaped cross section having two panel type legs, the free vertical edges of which are turned back upon themselves to form a return bent portion; a supporting member for said exterior trim piece, said supporting member comprising first and second portions each of which is adapted to lie adjacent said legs of said exterior trim piece with the free vertical edges thereof received within the groove formed by said return bent portions of said exterior trim piece, said first and second portions being joined by a third portion at least a part of which is planar and lies in a plane which intersects said legs of said exterior trim piece in equal angles, said planar part of said third portion being provided with at least one opening; retaining means positioned in said opening of said planar part of said third portion of said supporting member; a clamping member having a central planar portion which lies in parallel relationship to said planar part of said third portion of said supporting member, said clamping member having panel type legs extending from either side of said central planar portion adapted to lie respectively in parallel spaced relationship to said panel type legs of said exterior trim piece and to said first and second portions of said supporting

member, said central planar portion of said clamping member being provided with at least one opening which corresponds to said opening in said planar part of said third portion of said supporting member; the inner metal skin of one panel and the inner metal skin of the other panel defining a first included angle between said panels, said first and second portions of said supporting member defining a second included angle therebetween, said second included angle being less than said first included angle, and said panel type legs of said clamping member defining a third included angle therebetween, said third included angle being greater than said first included angle; and fastening means extending through said opening in said clamping member and said opening in said supporting member into said retaining means, whereby the tightening of said fastening means effects a structural tie between said pair of panels by squeezing action of said first and second portions of said supporting member and said legs of said clamping members upon said outer and inner metal skins of said panels, respectively, at the points of contact between said skins and said supporting and clamping members, with the force of said squeezing action being substantially equal to or exceeding the frictional forces between said supporting and clamping members and said outer and inner metal skins respectively, when intimate contact results therebetween.

4,192,114

ARRANGEMENT FOR INTERCONNECTING BUNDLES OF PRESTRESSING TENDONS FOR PRESTRESSED CONCRETE

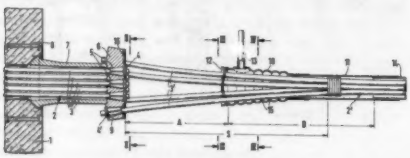
Dieter Jungwirth, Munich; Josef Renoth, Landshut-Altdorf, and Johann Wlodkowski, Munich, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,385

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657202

Int. Cl.² E04C *3/10*

U.S. Cl. 52—230 **8 Claims**



1. An arrangement forming an intermediate anchorage between an axially extending first bundle and an axially extending second bundle of longitudinal prestressing tendons for a prestressed concrete structure with said first and second bundle disposed in serial and general axial alignment, said first bundle arranged to be located within a first poured concrete section of the structure and said second bundle arranged to be located within a second poured concrete section which is contiguous to and is poured after the first section, means for enclosing said second bundle throughout a portion of the axial length for maintaining said tendons out of contact with the concrete poured in said second section, said means including an axially elongated tubular sheathing member for said bundle, said tubular sheathing member enclosing said second bundle for a part of its axial length and the tendons of said second bundle within said tubular sheathing member being in substantially parallel relation and having a normally close spacing about the longitudinal axis of said tubular sheathing member, said tendons being capable of post-tensioning and being longitudinally movable within said means for enclosing said second bundle, a disk-shaped anchorage member having a central part and a radially outer part extending circumferentially around said central part, said central part having the axis thereof in general axial alignment with the axes of said first and second bundles, said anchorage member located in said second concrete section between the end of said first concrete section adjacent to said second concrete section and the adjacent end of said means for enclosing said second bundle, said anchorage member disposed in axially spaced relation from the adjacent end of said means enclosing said second bundle, the tendons of said first bundle being anchored in said central part, the tendons of said second bundle being anchored in said radially outer part radially outwardly from the tendons of said first bundle and being spaced apart a greater distance radially outwardly from the longitudinal axis of said bundle than in the normally close spacing within said tubular sheathing member, the tendons of said second bundle converging inwardly relative to one another from the spacing in said anchorage member as then extend longitudinally from said anchorage member into the normally close spacing within said tubular sheathing member, and the adjacent end of said tubular sheathing member for said second bundle located closer to said anchorage member is spaced in the longitudinal direction of said tendons from said anchorage member so that when concrete is poured in the second section at least a longitudinally extending part of the tendons in said second bundle extending between said anchorage member and the point at which the tendons are in normally close spacing within said tubular sheating member is not covered by said means for enclosing said second bundle and is directly encased in the poured concrete of said second poured concrete section.

4,192,115

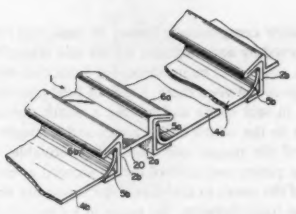
ELONGATED SHINGLE ASSEMBLY

Ryohei Yamamoto, No. 9 Shinonomecho-5, Chitose, Hokkaido, Japan

Continuation-in-part of Ser. No. 767,119, Feb. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 603,949, Aug. 12, 1975, abandoned. This application Feb. 23, 1978, Ser. No. 880,564

Int. Cl.² E04C *1/34*; E04D *1/36*

U.S. Cl. 52—468 **7 Claims**



1. An elongated shingle assembly including,

(a) a flange member comprising a base portion, and a pair of vertical walls extending from said base portion, said walls being spaced apart and parallel to each other and having inner surfaces facing each other and outer surfaces facing away from each other,

(b) a pair of flat shingle member each having an upwardly extending brim portion in an assembled position,

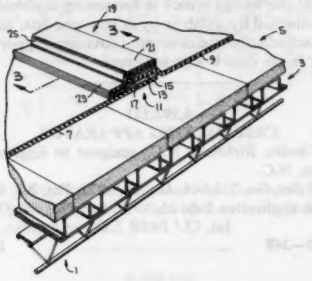
(c) a shelter member means joining said shingle members to said flange member and protecting the shingle members comprising, a horizontal member extending between said pair of vertical walls, a pair of in situ deformable flap members each extending adjacent to one of said vertical walls, and means for interconnecting said pair of flap members with said horizontal member, whereby said shingle members are joined to said flange member by forcibly curling the brim portions of said shingle members upwardly against outer surfaces of said vertical walls and adjacent said deformable flap members, and said flap members being deformed in situ so as to cover and grip the brim portions, said flange member and said shelter member means being integrally formed from a unitary piece of material.

4,192,116

TAPED AND DOUBLE GLUED RUBBER JOINT

Thomas L. Kelly, 50 Randolph Ave., Waterbury, Conn. 06710

Filed Nov. 24, 1978, Ser. No. 963,193
Int. Cl.[2] B32B *3/00*; E04D *1/36*
U.S. Cl. 52—469 **2 Claims**



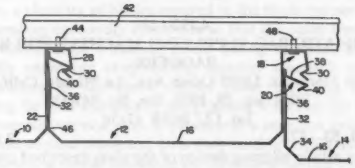
1. A joint for sealing together end portions of adjacent cured rubber membranes adapted for use in a roof construction, and the like, the end portions of said adjacent cured rubber membranes being lapped and sealed together by adhesive means, and a flexible composite tape element comprising a cured rubber portion overlaying an uncured gum rubber portion, the two portions being adhesively sealed together, said composite tape elements being applied linearly over the joint between the end portions of the cured rubber membranes and being caused to adhere to the end portions of said cured rubber membranes by an adhesive means, and upon application of said composite tape to and over said lapped joint said composite tape assumes the shape of said lapped joint providing with said sealed lapped joint a double seal for the joint between adjacent rubber membranes.

4,192,117

SPRING ACTION PANEL INTERLOCK

William C. Heirich, 2912 Wauhilah Dr., Muskogee, Okla. 74401

Continuation of Ser. No. 798,104, May 18, 1977, Pat. No. 4,091,588. This application May 18, 1978, Ser. No. 907,196
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—478 **4 Claims**



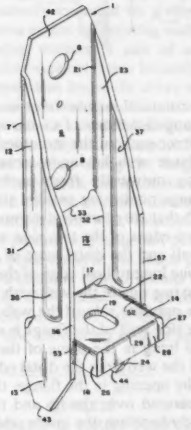
1. In a paneling system having a supporting member defining a plane and a plurality of flexible panels connected to each other and to said supporting member, the improvement comprising a first of said plurality of panels having a main section, a first section extending from one end of said main section along a plane that is substantially perpendicular to said plane of said supporting member, a second section extending from said first section and resting against said supporting member, a fastener attaching said second section to said supporting member, a third section extending from said second section away from said supporting member and defining a channel in conjunction with said first and second sections, a lip formed at the end of said third section having a first leg extending from said third section toward said first section along a plane that intersects the plane of said first section and a second leg extending from the end of said first leg away from said first section along a plane that intersects the plane of said first section, and a second of said plurality of panels adjacent and locked to said first of said plurality of panels having a main section, a first section extending from one end of said main section to said supporting member and abutting said first section of said first panel, a second section extending from said first section along a plane that intersects the planes of said first section and said third section of said first panel, a lip formed at the end of said second section of said second panel including a leg that extends toward said first section of said second panel along a plane that corresponds to said plane of said first leg of said lip of said first panel.

4,192,118

HOLDOWN FOR ATTACHING WOOD FRAMING MEMBERS TO CONCRETE FOUNDATIONS

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Dec. 13, 1978, Ser. No. 969,222
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—714 **9 Claims**



1. A holdown for connecting wood frame members to concrete foundations comprising:

a. an elongated back member having a first side edge and a second edge spaced from said first edge and substantially parallel thereto and said back member is formed with a plurality of longitudinally spaced openings adapted for engagement with a face of said wood frame member and adapted for attachment thereto by means of fasteners inserted through said openings;

b. a first side member integrally formed with said back member along said first side edge and positioned substantially at a right angle thereto;

c. a first leg member connected to said side member and extending downwardly therefrom and adapted for resting upon said foundation;

d. a seat member formed from material removed from said back member and having a back edge connected to said back member and a first side edge connected to said side member, and formed with a fastener opening for insertion of a fastener therethrough adapted for attachment to said concrete foundation;

e. said seat member is formed with a second side edge spaced from said first side edge and substantially parallel thereto;

f. a second side member integrally connected to said back member along said second edge;

g. said second side edge of said seat member is connected to said second side member; and

h. a second leg member connected to said side member and extending downwardly therefrom and adapted for resting upon said foundation.

4,192,119

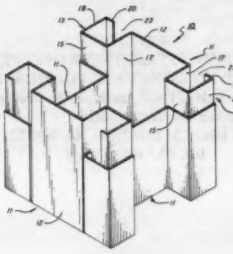
STRUCTURAL MEMBER

Wesley T. Murphy, Auburn, N.Y., assignor to E.T.I. Corporation, Auburn, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,825

Int. Cl.[2] E04C *1/30*

U.S. Cl. 52—588 **3 Claims**



1. A flanged structural member that is adapted to interlock with a second flanged member of similar construction to form a right angle corner section, the structural member including an elongated planar web having a rectangular, open-sided, flange depending outwardly from each longitudinal edge thereof, each flange containing parallel side walls of substantially equal depth that are positioned normal to the plane of the web, the proximal edges of the two side walls being cojoined by a flat base wall and the distal edge of the inner side wall being joined to one longitudinal edge of the web to project the flange laterally to one side of the web with the open side of the flange facing the opposite side of the web whereby the distal edge of the outer side wall of the flange is situated in the plane of the web, a lip lying in the plane of the web that depends inwardly toward the web from the distal edge of the outer side wall to restrict the opening in the flange, the outside depth of the flange as measured over the lip and the base wall being equal to or slightly less than the inside width of the flange as measured between the inside surface of the two side walls whereby the lip of a flange on one member may be inserted into the opening of a flange on a second member and the members rotated to bring the webs into perpendicular alignment wherein one flange is securely seated in wall to wall contact within the other flange.

4,192,120

METHOD OF CONSTRUCTING REINFORCED CONCRETE BRIDGES

André J. Richard, Liege; Philippe M. Delmotte, Ramillies-Offus, and Pierre A. Parthoens, Bassenge, all of Belgium, assignors to Entreprises de Travaux Publics et Privés J. Richard Société Anonyme, Loncin-Liége, Belgium

Filed Dec. 12, 1977, Ser. No. 859,529

Claims priority, application Belgium, Dec. 17, 1976, 45795

Int. Cl.[2] E04G *21/02*; E04B *1/32*

U.S. Cl. 52—741 **7 Claims**

1. A method of constructing bridges of reinforced concrete, including the steps of providing a supporting arch having a reinforcing part intended to be embedded into the concrete and an exterior part intended to be taken down after the concrete has set, the supporting arch having a cocked center, erecting the supporting arch on a pair of horizontally spaced supports, placing shuttering in position on the arch, and embodying at least the reinforcing part of the arch in concrete to constitute the deck of the bridge which is formed by a ribbed slab, by girders connected by a slab or by at least one box, said part of the arch embodied in the concrete providing supporting reinforcement in the final bridge structure.

4,192,121

CASE PACKING APPARATUS

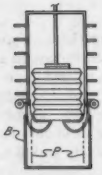
Otis M. Caudle, Richfield, N.C., assignor to Eggineers, Inc., Charlotte, N.C.

Division of Ser. No. 762,644, Jan. 26, 1977, Pat. No. 4,086,745.

This application Feb. 21, 1978, Ser. No. 879,377

Int. Cl.[2] B65B *5/06*

U.S. Cl. 53—248 **10 Claims**



1. Apparatus for releasing objects into a space comprising object engaging means having a flexible extent disposed for releasably restraining objects in a path of delivery to the space, said flexible extent having an end disposed adjacent the path of delivery and an other end positionable in the path of delivery, said extent being flexible between its ends for object restraining deflection partially about objects in the path upon engagement therewith, and movable means supporting said other end of said flexible extent in the path of delivery and being operable to position the other end progressively downstream and outwardly with respect to the path of delivery to a position out of the path for advance of the deflecting object engagement progressively downstream and ultimately out of engagement with objects, thereby providing progressive delivery and ultimate release of objects into the space.

4,192,122

AUTOMATIC BAG SUPPLYING MACHINE FOR BREAD BAGGERS

Augusto Florindez, 13029 Ocaso Ave., La Mirada, Calif. 90638

Filed Sep. 29, 1978, Ser. No. 947,133

Int. Cl.[2] B65B *43/36*

U.S. Cl. 53—572 **9 Claims**

1. An article bagging device of the class described comprising:

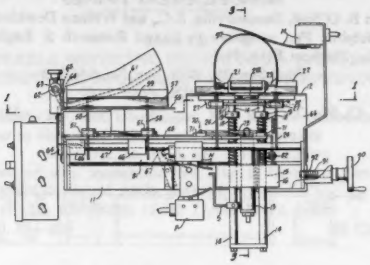
a. a support means, carrying a stack of bags held in stack form by a wicket having downwardly projecting rods and into which individual bags, the article to be bagged is inserted;

b. clamping means on said support means engageable with said downwardly extending rods to hold said stack of bags in place;

c. holding means for holding a stack of replacement bags which are to be used to replace the bags on said support means when they become exhausted, said holding means having clamper elements for clamping the vertical rods of said replacement stack of bags; and

d. means for moving said remnants of said stack of bags on said support from said support means and replacing said

stack by a fresh stack of bags, and having means for removing said rods from the clamping means of said first



stack of bags and moving said replacement stack of bags into operating position whereby they are held in place by said clamper means.

4,192,123

AGRICULTURAL MOWER

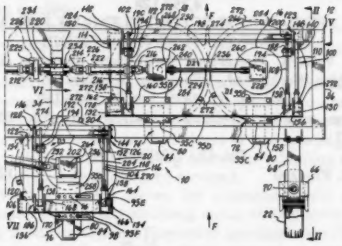
Robert Allely, Coventry, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 23, 1977, Ser. No. 863,641

Claims priority, application United Kingdom, Jan. 6, 1977, 00309/77

Int. Cl.[2] A01D *55/26*

U.S. Cl. 56—13.6 **2 Claims**



1. An agricultural mower comprising a frame; first, second and third crop cutting rotors, each crop cutting rotor including a rotor support, a blade carrier plate rotatably journaled on the rotor support for rotation about a generally vertical axis of rotation, a plurality of blades secured to the blade carrier plate and extending outwardly therefrom so that the outer free ends of the blades trace a cutting circle during rotation, and an upwardly extending crop-feeding member mounted on the upper surface of the blade carrier plate; mounting means mounting the first and second crop cutting rotors on the frame with generally vertical axes of rotation in a common generally transverse vertical plane and with their cutting circles overlapping; mounting means mounting the third crop cutting rotor on the frame to the rear and to one side of the first and second crop cutting rotors and spaced from the second crop cutting rotor a distance of at least one eighth of the diameter of the cutting circle of said third crop cutting rotor; drive means mounted on the frame and connected to and contra-rotating the first and second crop cutting rotors so that adjacent portions of the first and second crop cutting rotors move rearwardly and crop material cut by the first and second crop cutting rotors passes between their upwardly extending crop feeding members; and drive means mounted on the frame and connected to the third crop cutting rotor to drive said third crop cutting rotor in the same direction as the second crop cutting rotor so that crop material cut by the third crop cutting rotor passes between the second and third crop cutting rotors.

4,192,124

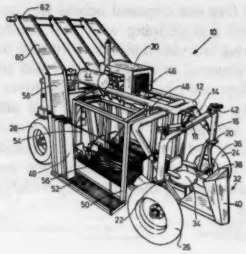
TOBACCO HARVESTER

Gary E. Balthes, Tillsonburg, Canada, assignor to Balthes Farm Equipment Manufacturing, Tillsonburg, Canada

Filed Jun. 5, 1978, Ser. No. 912,428

Int. Cl.[2] A01D *45/16*

U.S. Cl. 56—27.5 **8 Claims**



1. A tobacco leaf picking device for attachment to a tobacco leaf harvester comprising a pair of support frames, a pair of defoliators, each rotatively mounted on a respective support frame, a hydraulic drive means for rotating said pair of defoliators in counter-rotating manner, a pair of conveyors each mounted on a respective support frame located beneath one of said defoliators, independent hydraulic drive means for moving said conveyors in opposite directions to convey picked leaves outwardly from under said defoliators, a pair of endless belts each mounted on a respective support frame by pulley means to oppose one another along the length of opposing sides of said pair of conveyors, independent hydraulic drive means for driving said belts in opposite directions where said belt mounting in combination with attachment of support frames to a harvester permits opposing belt portions to engage and support tobacco plant stalks as the plants pass through the leaf picking device, a separate control means for each of said independent hydraulic drive means, the speeds at which said defoliators, conveyors and belts are driven being independently adjustable of one another by each of said separate control means.

4,192,125

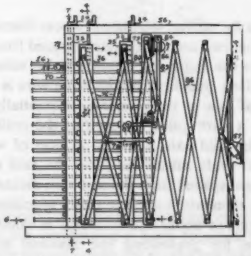
RECIPROCATING FRUIT HARVESTER

Robert H. Reynolds, and Elmo M. Reynolds, both of 202 Bedford St., C66, Sun City Center, Fla. 33570

Filed Dec. 9, 1974, Ser. No. 530,845

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—328 R **5 Claims**



1. A fruit harvesting unit comprising a main frame, a movable support frame mounted on said main frame, a first and second movable tube support bodies mounted on said movable support frame, a first scissor linkage mounted on said first tube

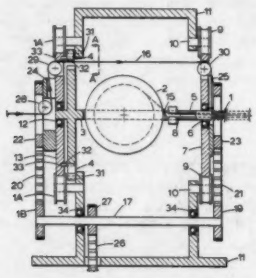
support body and connected to said second tube support body, a second scissor linkage mounted on said movable support frame and connected to said second tube support body so as to reciprocate said two movable support bodies in opposite directions, at least two elongated tubes having one end mounted on one body of said two movable tube support bodies, at least one elongated tube disposed adjacent said first mentioned tubes and having one end mounted on the other said movable tube support body and free end disposed behind free ends of said first mentioned tubes and defining with first mentioned tubes an area for receiving individual pieces of fruit for harvesting such that upon the disposal of a piece within said area and axially movement of first said mentioned movable tubes relative to the opposite axially directed movement of said other mentioned movable tube, said piece of fruit is drawn within the grasp of said tubes, rotated and in the process is separated from its stem and said fruit is held after separation from stem within the grasp of said tubes during the outwardly withdrawal period of tubes from tree.

4,192,126

COILING MACHINE

John P. S. Nolan, Northwood, England, assignor to Skemmili Limited, London, England

Filed Jul. 24, 1978, Ser. No. 927,148
Int. Cl.[2] B65H *81/08*
U.S. Cl. 57—3 **11 Claims**



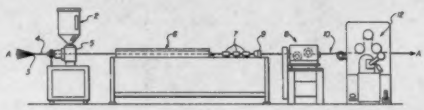
1. A machine for coiling wire about a core filament comprising a main frame, two coiling elements spaced from each other and mounted in the frame for rotation about substantially the same axis, a hollow mandrel on which the wire is to be coiled, the longitudinal axis of the mandrel substantially coinciding with said axis, a wire guide on each of the coiling elements spaced from the said axis whereby a loop of wire may be formed with its ends substantially on the said axis and the remainder thereof spaced from the said axis, means for rotating the two coiling elements in a substantially synchronous fashion so that wire guided about the elements is coiled on to the mandrel, means for preventing the mandrel from rotating relative to the frame, and means for feeding a core filament through the hollow mandrel, wherein the mandrel carries a plurality of pins around which coils of wire are formed, the mandrel having a tapering portion up which a coil in the process of being formed rides and thereby pushes off from the pins a previously formed coil.

4,192,127

METHOD AND APPARATUS FOR MAKING MONOFILAMENT TWINES

John B. O'Neil, Summerville, S.C., and William Dewhirst, Philadelphia, Pa., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 28, 1978, Ser. No. 946,889
Int. Cl.[2] D02G *3/38, 3/40*
U.S. Cl. 57—7 **11 Claims**



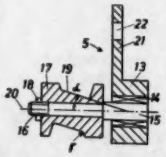
1. A method of making twine comprising continuously drawing a bundle of substantially parallel synthetic monofilaments along a path at a rate in the range of 200 to 2000 feet per minute, imparting a false twist to said bundle of monofilaments at a rate of about 3 to 30 turns per linear foot and directing a stream of molten synthetic material onto the outer surface of said moving, twisted monofilament bundle to form a spiral band therearound, the molten material being directed onto the surface of said bundle at a temperature and pressure sufficient to cause the band which is formed to fuse to the contacted monofilaments without materially affecting the strength of the fused monofilaments.

4,192,128

THREAD DEFLECTING ELEMENT FOR A DRAW-TEXTURING MACHINE

Walter Vetterli, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jul. 19, 1978, Ser. No. 926,130
Claims priority, application Switzerland, Jul. 23, 1977, 9118/77
Int. Cl.[2] D01H *13/04*
U.S. Cl. 57—290 **12 Claims**



1. In a draw-texturing machine, the combination comprising
a first pair of rolls for supplying a continuous thread therebetween;
a main heater for heating a supplied thread;
a false twist device downstream of said heater relative to the path of the thread for imparting a false twist in the thread;
a second pair of rolls downstream of said false twist device relative to the path of the thread for drawing the thread relative to said first pair of rolls; and
a deflecting means adjacent said heater for deflecting the thread to pass said heater in two passes, said means including a cantilevered rotatably mounted shaft and a deflecting element secured to said shaft for rotation therewith, said element including a cylindrical surface disposed about a first axis;
a pair of flanges having said cylindrical surface disposed therebetween, said flanges being of larger diameter than said surface; and
a bore extending through said element on a second axis

angularly disposed to said first axis at an angle of from 5 degrees to 20 degrees.

4,192,129
MOVABLE SERVICING DEVICE FOR A SPINNING MACHINE, ESPECIALLY AN OPEN END SPINNING MACHINE

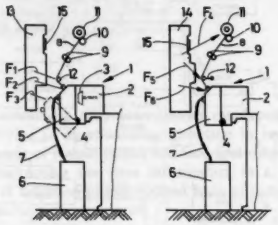
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany

Filed Oct. 15, 1976, Ser. No. 732,880

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546436; Jul. 15, 1976, 2631791

Int. Cl.² D01H *15/00, 11/00, 13/14, 1/12*

U.S. Cl. 57—301 **35 Claims**



1. Servicing apparatus for at least one spinning machine comprising:

servicing means for servicing spinning assemblies of a spinning machine,

moving means for moving said servicing means to respective servicing positions adjacent the respective spinning assembly to be serviced,

disturbance responsive control means for controlling said moving means to move said servicing means to a servicing position adjacent a spinning assembly in response to detection of an operational disturbance at said spinning assembly, whereby those spinning assemblies exhibiting an operational disturbance can be serviced,

step-by-step control means for controlling said moving means to move said servicing means to respective servicing positions adjacent respective spinning assemblies in a predetermined sequence, where preventive maintenance servicing operations can be carried out by said servicing means,

and switchover means for switching control of said moving means between said disturbance responsive control means and said step-by-step control means.

4,192,130
TIME COUNTING CONTROL SYSTEM

Eiichi Takeuchi, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,211

Claims priority, application Japan, Dec. 1, 1976, 51/144544

Int. Cl.² G04C *3/00*

U.S. Cl. 368—155 **7 Claims**

1. A time counting control system comprising:

a reference oscillator for generating reference clock signals having a reference frequency;

timing signal generating means coupled to said reference oscillator for generating at least a read-in clock signal on the basis of a reference clock signal delivered from said reference oscillator;

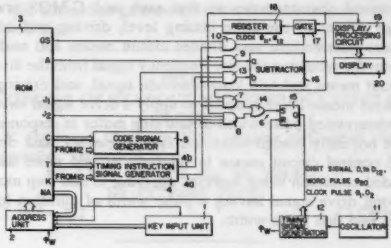
microprogrammed control means including:

an address register coupled to said timing signal generating means and whose read-in operation is controlled by said read-in clock signals received from said timing signal generating means;

an address section coupled to said address register; and

a microprogram storing section coupled to said address section for storing microprogrammed micro-instructions and delivering a micro-instruction from an address which has been designated by said address section, said microinstructions being successively executed to achieve at least a time-counting operation; and

a count/operation means including:



an arithmetic operation unit coupled to said microprogrammed control means for carrying out an arithmetic operation every time said microprogrammed control means delivers a predetermined number of micro-instructions; and a register coupled to said arithmetic operation unit for storing time-counting information and which is controlled by said delivered micro-instructions.

4,192,131
STEP MOTOR CONTROL MECHANISM FOR ELECTRONIC TIMEPIECE

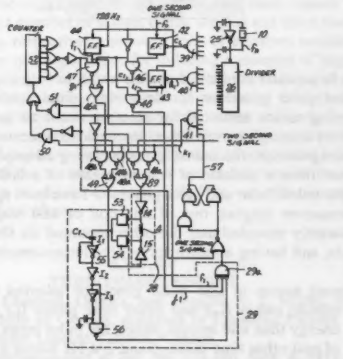
Minoru Hosokawa; Hiroshi Ishii; Yoshikazu Kawamura, and Sakiho Okazaki, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,957

Claims priority, application Japan, Jan. 19, 1977, 52-4728; Jan. 28, 1977, 52-8465

Int. Cl.² G04C *3/00*

U.S. Cl. 368—157 **9 Claims**



1. An electronic timepiece comprising in combination oscillator means for producing a high frequency time standard signal, divider circuit means for producing low frequency time signals in response to said high frequency time standard signal; a step motor including a drive coil for receiving a drive signal and being stepped in response thereto; a gear train driven by said step motor and adapted to place the step motor in one of a first normally loaded condition and a second more heavily loaded condition; load detection means including C-MOS

differentiator circuit means for detecting current peaks in the current signal induced in the drive coil of the step motor after each application of a drive signal thereto for producing a load detection signal representative of the load condition placed upon the step motor, said differentiator circuit means including at least two C-MOS inverter stages, each of said C-MOS inverter stages being fabricated in a substrate and having substantially the same dimensional characteristics and equivalent electrical characteristics so that each said C-MOS inverter stage admits of the same biasing level; driving and control means intermediate said divider circuit means and said step motor for receiving the low frequency signal from the dividing circuit means and said load detection signal, said driving and control means being adapted to apply a drive signal having a predetermined pulse width of said step motor in response to a first normally loaded condition being detected, said driving and control circuit means in response to said more heavily loaded condition being detected applying to said step motor a second drive signal having a pulse width of duration longer than said first pulse width.

4,192,132

QUARTZ CONTROLLED ANALOG WATCH

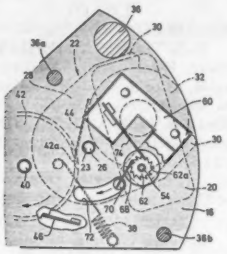
Adolf Sedlak, Wurmberg-Neubaerental, and Horst Friedrich, Pforzheim, both of Fed. Rep. of Germany, assignors to Timex Corporation, Waterbury, Conn.

Filed May 21, 1979, Ser. No. 40,623

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827790

Int. Cl.[2] G04C *3/04*

U.S. Cl. 368—160 **5 Claims**



1. In a quartz controlled analog watch having a quartz controlled pulse generator for delivering minute pulses and an indexing means mounted for rotation about an axis and for directly driving a minute wheel through the intermediary of an indexing device, the indexing means being adapted to be deflected from a position of rest by means of a coil to which output pulses from said pulse generator have been applied, and a permanent magnet, one of said coil or said magnet being stationarily mounted and the other mounted on the indexing means, and having a return spring, the improvement comprising:

circuit means in said pulse generator adapted to deliver minute pulses (i_m) and other time pulses (i_s) weaker in energy than said minute pulses, the pulse series frequency of said other time pulses being 1/n Hz where n is an integer less than 60.

means coupling said minute pulses and said other pulses to said coil, whereby the indexing means is deflected by said other time pulses (i_s) from its position of rest to a first indexing position and beyond that by the minute pulses (i_m); to a second indexing position,

a second wheel having a second hand and adapted to be driven by the indexing means to index the second wheel at the first indexing position, and,

said indexing means being arranged only to index the minute wheel when it is deflected to the second indexing position by the minute pulse i_m.

4,192,133

ELECTRONIC WATCH WITH MEANS FOR PRODUCING PULSE SOUND AT SELECTED INTERVALS

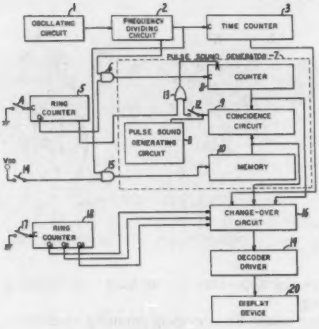
Shojiro Komaki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 12, 1977, Ser. No. 824,315

Claims priority, application Japan, Aug. 13, 1976, 51/96826

Int. Cl.[2] G04C *21/16*

U.S. Cl. 368—73 **4 Claims**



1. An electronic watch having chronographic performance comprising an oscillating circuit to provide a standard signal, frequency dividing circuit means for dividing said standard signal to provide a 1 Hz signal and also a higher frequency signal, first counter circuit means receiving said 1 Hz signal and providing a count of seconds, minutes and hours, and pulse sound generating circuit means for generating pulse sounds at different selected intervals of more than one second, said pulse sound generating means comprising a pulse sound generator, memory circuit means for memorizing a selected time interval at which said pulse sounds are to be emitted, manually operable means for setting the time interval memorized by said memory circuit means, second counter circuit means receiving and counting said higher frequency signal from said frequency dividing circuit means, and coincidence circuit means having inputs connected respectively with said memory circuit means and said second counter circuit means and an output connected with said pulse sound generating means and to a reset terminal of said second counter circuit means to activate said pulse sound generating circuit means and to reset said second counter circuit means upon coincidence of the output of said second counter means with the interval memorized by said memory circuit means.

4,192,134

ELECTRONIC TIMEPIECE CORRECTION DEVICE

Makoto Yoshida, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Japan

Filed Oct. 26, 1977, Ser. No. 845,559

Claims priority, application Japan, Oct. 28, 1976, 51-129921

Int. Cl.[2] G04B *27/00*; G04C *3/00*

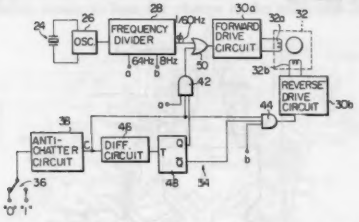
U.S. Cl. 368—80 **6 Claims**

1. A time correction system for an electronic timepiece having a frequency standard, a frequency divider providing a low frequency time unit signal, a first train of output pulses and a second train of output pulses, the frequencies of said first and second trains of output pulses being higher than the frequency of said time unit signal and different from one another, and a display device providing a display of time information in re-

sponse to the time unit signal, said time correction system comprising:

a single push-button type correction switch responsive to actuation for producing a correction signal;

circuit means having a toggle effect and including first and second outputs at which first and second output signals alternately appear in response to each occurrence of said correction signal; and



means for correcting time information displayed by said display device in an advancing direction in response to said first train of output pulses and said first output signal, and for correcting the time information in a retarding direction in response to said second train of output pulses and said second output signal.

4,192,135

PORTABLE ELECTRONIC DEVICE

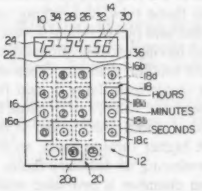
Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Company Limited, Japan

Filed Dec. 22, 1977, Ser. No. 863,469

Claims priority, application Japan, Dec. 27, 1976, 51/157792; Feb. 9, 1977, 52/13338; Feb. 10, 1977, 52/15548[U]

Int. Cl.[2] G04C *9/00*

U.S. Cl. 368—62 **6 Claims**



1. In a portable electronic device having timepiece circuitry including a frequency standard providing a relatively high frequency signal, a timing signal generator responsive to the relatively high frequency signal, to provide a time unit signal, a timekeeping circuit responsive to the time unit to provide time data, a driver circuit responsive to the time data to provide drive signals and a display device responsive to the drive signal to provide a display of time by means of a plurality of groups of digits with each of said groups of digits comprising a units digit and a tens digit, the improvement comprising:

a plurality of numeric keys, each of said numeric keys providing a numeric signal when actuated;

a plurality of switch means, each of said switch means providing a digit selection signal corresponding to one of said groups of digits when actuated;

correction gate means provided in said timekeeping circuit;

detection and counter means responsive to said numeric signal for detecting at least two successive actuations of said numeric keys and for producing output signals indicative thereof; and

control circuit means responsive to said digit selection signal for generating an output signal indicative of one only of the units digit and tens digit of a group of digits selected for correction, and including means for applying said numeric signal to said correction gate means to correct said selected digit to a value corresponding to said numeric signal, and further responsive to an output signal from said detection and counter means for automatically shifting to select the as yet uncorrected one of said units digit and tens digit, whereby a numeric signal produced by a subsequent actuation of said numeric keys is applied to said correction gate means to correct said as yet uncorrected digit.

4,192,136

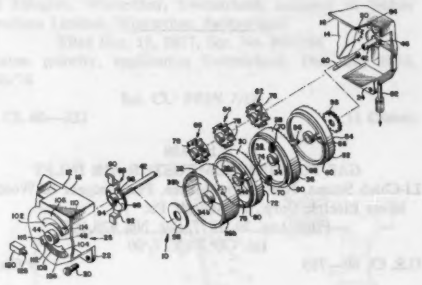
ADJUSTMENT OF READOUT MEMBERS IN A DIGITAL CLOCK

Ralph C. Robinson, Charlotte, N.C., assignor to General Time Corporation, Thomaston, Conn.

Filed Mar. 24, 1977, Ser. No. 780,842

Int. Cl.[2] G04B *19/02*

U.S. Cl. 368—222 **12 Claims**



1. A digital readout apparatus including, in combination, a plurality of members carrying indicia representative of units-of-minutes, tens-of-minutes, and hours, respectively, arranged in ordered sequence, a shaft, housing means supporting said shaft and said shaft, in turn, supporting said members for rotation whereby a readout of time may be viewed at a window in said housing means, means limiting axial receipt of said member of lowest order toward one end of said shaft, means for indexing said member of lowest order, second and third means cooperating, respectively, between pairs of members including said member of lowest order for indexing a member of higher order by a member of lower order whereby the indicia presentation located to said window will be indicative of time, and means acting between said housing means and said hour member which is capable of selective adjustment to any one of a plurality of positions whereby through adjustment said hour member and the member of next lower order may be located within limits of adjustment on said shaft to vary the clearance between all members.

4,192,137

TURBOSHAFT ENGINE

Marcus S. Chappell, Ottawa, and Douglas A. J. Millar, Winchester, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

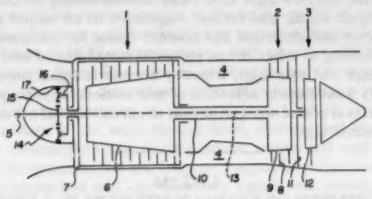
Continuation-in-part of Ser. No. 774,280, Mar. 4, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,118

Int. Cl.[2] F02C *3/10*

U.S. Cl. 60—39.16 R **1 Claim**

1. A turboshaft engine comprising a compressor having a rotor and stator casing, a gas generator turbine having a rotor and a fixed stator, a power turbine having a rotor and a fixed stator, and an output shaft connected with the power turbine; said compressor rotor being connected with the gas generator turbine rotor; and said compressor stator casing being rotat-

ably mounted and coaxial with the compressor rotor and interconnected with the output shaft for allowing rotation of the



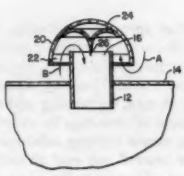
compressor casing in the direction of the compressor rotor at a speed less than that of the compressor rotor and in proportion to the output shaft speed.

4,192,138

GAS TURBINE COMBUSTOR AIR INLET

Li-Chieh Szema, Nether Providence, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,465
Int. Cl.[2] F02C 7/00
U.S. Cl. 60—759 **9 Claims**



1. In a combustion chamber for a gas turbine engine wherein said chamber comprises an axially extending shell member generally closed at the upstream end and having an array of openings through said shell at a predetermined axial location along said member for admitting air into said chamber, a generally radially extending tube member disposed within each of said openings to impart an inward direction to said air for penetration thereof into said chamber, said tube members extending both inwardly and outwardly of said shell to define an exterior air inlet and interior air outlet and wherein the improvement comprises:

a symmetrical cap member disposed to enclose said inlet in a spaced relation, with the innermost terminal periphery of said cap member radially inwardly of said inlet and having an inner diameter greater than the outer diameter of said tube member;

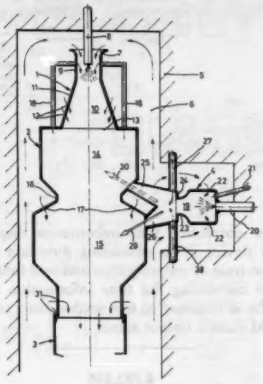
whereby all air entering said tube members must first flow generally outwardly into the space between said cap member and said inlet prior to entering said tube member, thereby providing a generally uniform flow into any one of said tube members irrespective of the generally random air flow exteriorly of said shell and also providing substantially equal flow through all of said tube members at said predetermined axial location on said shell.

4,192,139

COMBUSTION CHAMBER FOR GAS TURBINES

Rolf Buchheim, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,386
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629761
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—739 **8 Claims**



1. A combustion chamber for a gas turbine comprising a flame tube connected with an exhaust passage at its outlet end, and connected with a prechamber at its inlet end, said flame tube having first and second flame chambers and a narrow cross-section passage connecting said first and second flame chambers, wherein there are provided air inlet openings in the periphery of said flame tube on the downstream side of said narrow cross-sectional passage, said prechamber having a fuel delivery device and a ring-shaped air inlet opening at the end away from said flame tube, and having uncontrolled air inlet openings between said fuel delivery device and said flame tube, said prechamber having cross-sectional dimensions which are a selected amount smaller than the cross-section of said flame tube to cause a stable lean flame in said flame tube at fuel-air ratios below a selected value, and to cause flame flash-back and a stable rich flame in said prechamber at higher fuel-air ratios, associated with higher turbine loads, an auxiliary combustion chamber for producing an auxiliary flame, wherein said auxiliary combustion chamber is provided with a quantity of fuel for maintaining a rich auxiliary flame, first and second passages connecting said auxiliary combustion chamber with said first and second flame chambers, and wherein there are provided means for alternately directing said auxiliary flame through one of said passages into said first flame chamber or said second flame chamber in accordance with the load condition of said gas turbine.

4,192,140

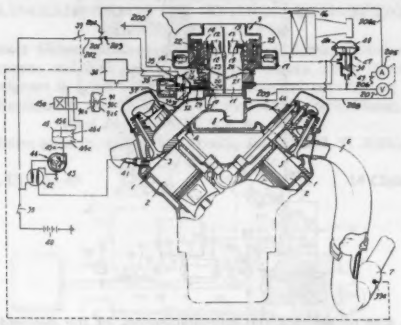
APPARATUS AND METHOD RELATING TO INTERNAL COMBUSTION ENGINES UTILIZING AN EXHAUST GAS REACTOR

Ryuichi Yamashita, and Hiromitsu Matsumoto, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 3, 1974, Ser. No. 501,856
Claims priority, application Japan, Jul. 16, 1974, 49-81553
Int. Cl.[2] F01N 3/14
U.S. Cl. 60—277 **13 Claims**

1. In a four-stroke, spark ignition, internal combustion engine adapted to utilize for operating conditions other than deceleration an air/fuel charge which is not richer than stoi-

chiometric derived from a fuel supply means which delivers a fuel/air mixture that is not richer than stoichiometric, said engine being of the type which includes a combustion chamber, induction means for receiving said mixture and introducing said charge to the combustion chamber, an exhaust conduit for removing spent charge from the combustion chamber, an exhaust gas reactor in the exhaust conduit, and a throttle valve controlling flow of air into the induction means, the improvement comprising: means for enriching the charge in the induction means; means to lean the charge in the induction means;



control means responsive to pressure in the induction means characteristic of the closure of the throttle valve at deceleration conditions, said control means operatively effective on the means for leaning the charge by adjusting the amount of air or fuel in the induction means for a predetermined and limited time after said closure; and control means responsive to said pressure operatively effective on said means to enrich said charge in the induction means by adjusting the amount of air or fuel in the induction means after a delay from said closure so long as the said pressure persists.

4,192,141

EXHAUST GAS PURIFYING SYSTEM FOR ENGINES

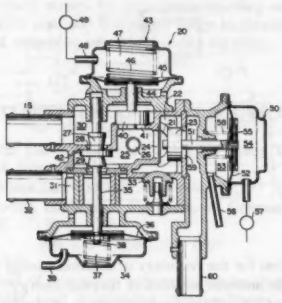
Takao Nonoyama, Toyota, and Takeru Yasuda, Nagoya, both of Japan, assignors to Toyota Jidosha Kegko Kabushiki Kaisha, Toyota, Japan

Filed Jul. 26, 1977, Ser. No. 819,158

Claims priority, application Japan, May 2, 1977, 52-50941; May 2, 1977, 52-50943

Int. Cl.[2] F01N *3/15*

U.S. Cl. 60—290 **10 Claims**



1. An air control valve comprising a body, first, second, third, fourth and fifth valve chambers formed in said body and having individual port means opened towards the outside of said body, a first valve structure of a diaphragm type operable between a first shift position of communicating said first chamber to said second chamber while isolating said first chamber from said fifth chamber and a second shift position of isolating said first chamber from said second chamber while communicating said first chamber to said fifth chamber, a second valve structure of a diaphragm type having a single valve element and controlling communication and isolation of said second chamber to and from said third chamber as well as communication and isolation of said second chamber to and from said fourth chamber in a mutually related manner, a third valve structure of a diaphragm type for selectively communicating said second chamber to said third chamber, and a fourth valve structure of a springload type for selectively communicating said second chamber to said fourth chamber, wherein said first, second, third and fourth valve structures are incorporated in said body so as to provide an integral valve assembly.

4,192,142

EXHAUST PIPE AND MOUNTING THEREFOR

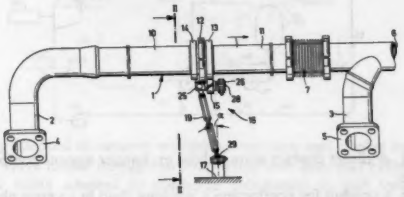
Gerd Hiegele, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 15, 1977, Ser. No. 860,964

Claims priority, application Switzerland, Dec. 30, 1976, 16460/76

Int. Cl.[2] F01N *7/00*

U.S. Cl. 60—322 **11 Claims**



1. In combination

an exhaust pipe having an elongated part, a bent part extending from said elongated part and an axial compensator in said elongated part to compensate for changes in axial length of said elongated part;

a pair of fixed support points; and

a pair of props disposed in different planes relative to each other between said support points and one of said parts, each said prop being articulated at one end to a respective support point and at an opposite end to said one part and being inclined relative to said elongated part in a direction opposite to the direction of thermal expansion of said elongated part.

4,192,143

EXHAUST PIPE

Gerd Hiegele, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 15, 1977, Ser. No. 860,965

Claims priority, application Switzerland, Dec. 30, 1976, 016459/76

Int. Cl.[2] F01N *7/00*

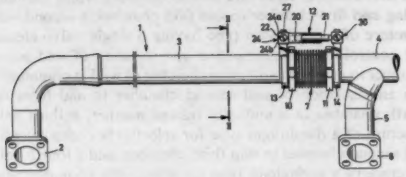
U.S. Cl. 60—322 **10 Claims**

1. In combination,

an exhaust pipe for a reciprocating internal combustion engine, said pipe having at least two coaxially disposed parts;

an axial compensator connected to and between said parts to permit relative axial expansion between said parts; and

strengthening means for preventing sag in said axial compensator, said means including at least one sleeve secured to



one of said parts and a mandrel secured to the other of said parts and slidably mounted in a respective sleeve.

4,192,144

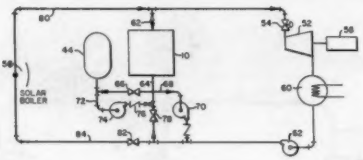
DIRECT CONTACT HEAT EXCHANGER WITH PHASE CHANGE OF WORKING FLUID

Bill L. Pierce, Whitehall, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 761,048, Jan. 21, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,767

Int. Cl.[2] F03G *7/02*

U.S. Cl. 60—641 **6 Claims**



1. A direct contact storage heat exchanger system comprising:

a. a conduit for conducting a working fluid in a vapor phase from a solar boiler to a prime mover;

b. a pressure vessel having lower means for passing said working fluid solely in the liquid phase into and out of said vessel and upper means for passing said working fluid in the vapor phase from and to said conduit into and out of said vessel said lower means including a storage tank, piping connecting the bottom of said pressure vessel and said storage tank, and structure for selectively transporting said fluid in a liquid phase between said storage tank and pressure vessel;

c. means for thermally insulating said vessel;

d. a plurality of pebbles packed within and substantially filling said vessel, said pebbles comprised of a material having a relatively high capacity for storing heat energy; and

e. means for maintaining a liquid level of said working fluid within said vessel and for adjusting said liquid level so as to selectively effect a liquid-vapor phase change of said working fluid within said vessel and to receive and discharge vapor from said vessel in a manner so as to maintain a substantially constant pressure in said conduit.

4,192,145

PROCESS FOR UTILIZING ENERGY PRODUCED BY THE PHASE CHANGE OF LIQUID

Seiyo Tanaka, Tokyo, Japan, assignor to Nihon Sekiyu Hanbai Kabushiki Kaisha, Tokyo, Japan

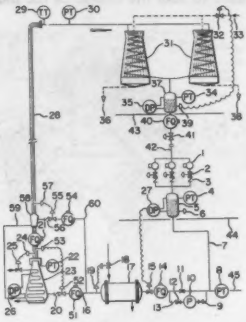
Filed Oct. 25, 1977, Ser. No. 844,737

Int. Cl.[2] F01K *7/00*

U.S. Cl. 60—675 **1 Claim**

1. Process for utilizing energy produced by the phase change of a liquid comprising the working fluid characterized in that a step of ascending the vapor of the liquid from a low place to a high place utilizing the difference of the vapor pressure of the liquid between the vapor pressure generated when said liquid is vaporized by heating it at the low place and that generated when the said ascending vapor of the liquid is cooled to liquify it at the high place;

a step of cooling said ascending vapor at the high place to liquify it and preferably to utilize the heat energy of the ascending vapor when said vapor is liquified;



a step of utilizing the potential energy of the descending liquid by letting the liquid fall which has been liquified at the high place;

astep of vaporizing the liquid descended by repeatedly heating the liquid; and characterized in that the liquid is uniformly mixed with the saturated or the super-heated ascending vapor and the resulting vapor containing the mist of the said liquid is transferred from the low place to the high place.

4,192,146

PROCESS FOR THE RECOVERY OF ENERGY AND IN PARTICULAR FOR THE RECOVERY OF HEAT ON THE HEAT PUMP PRINCIPLE

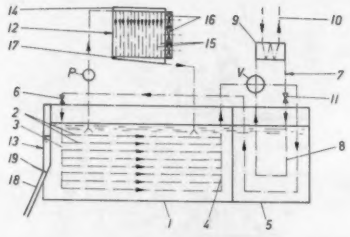
Helfried Credé, Fuchsbichl 9b, D-8021 Icking, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,435

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634233; Apr. 4, 1977, 2715075

Int. Cl.[2] F25B *27/00*; F25D *3/00*; F24H *7/00*

U.S. Cl. 62—2 **11 Claims**



1. A process for the recovery of thermal energy from generally available ambient sources of thermal energy, particularly from ambient air, whose temperature is above but may drop near 0° Centigrade, comprising the steps of exposing a confined body pf still water to heat exchange with at least one such source of thermal energy to transfer heat energy into the body of water and raise the temperature of the same; circulating a refrigerating medium through the body of water to withdraw heat energy from the same according to the heat-pump princi-

ple with the formation of ice therein when the temperature of said one source drops near 0° C.; continuing to effect withdrawal of heat energy from said body of water to withdraw the latent heat of fusion liberated during the formation of ice, so as to bridge those periods of time wherein said one source drops near or below 0° C. and until the temperature of said one source rises again; and thereupon re-melting the thus formed ice by heat exchange with said one ambient source of thermal energy.

4,192,147

ARRANGEMENTS FOR THE CONTROLLED INJECTION OF CRYOGENIC FLUID

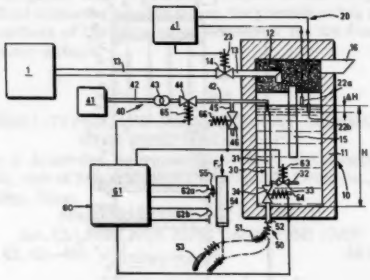
Ghislain Gilbert, Bures-sur-Yvette; Gerard Bentz, Elancourt-Trappes, and Jean Galey, Voisins Bretonneux, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 30, 1978, Ser. No. 920,678

Claims priority, application France, Jul. 5, 1977, 77 20553

Int. Cl.² F17C *7/02*

U.S. Cl. 62—49 **14 Claims**



1. An arrangement for injecting a predetermined quantity of the liquid phase of a cryogenic fluid stored in a storage tank, said arrangement comprising in combination: a container to hold the liquid phase, means including a supply valve connected to said container for supplying cryogenic fluid thereto from said tank, a system connected to the supply valve for controlling said supply valve, which system is sensitive to the level of liquid in said container, at least one metering member having a discharge valve, means including a filling valve communicating with the holding container for feeding liquid from said holding container to said metering member, said member being arranged to receive said predetermined quantity of said liquid, liquid distributing means connected to said discharge valve, and control means for selectively opening and closing said filling valve and said discharge valve to thereby control the filling and emptying of said metering member.

4,192,148

DEVICE TO CREATE COOLING THROUGH USE OF WASTE HEAT

Emil H. Spreter von Kreudenstein, 3 Am Kreuzweg, 8026 Ebenhausen, Fed. Rep. of Germany

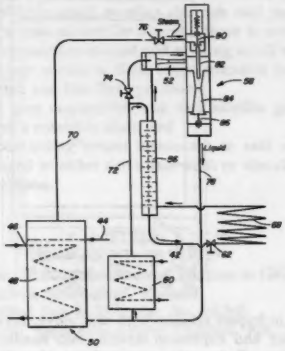
Filed Jun. 13, 1978, Ser. No. 915,297

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754783

Int. Cl.² F25B *1/00, 1/06*

U.S. Cl. 62—116 **7 Claims**

5. A method of operating apparatus for cooling an input liquid by waste heat comprising heat exchange means for receiving said waste heat and vaporizing a refrigerant, valve means comprising a steam valve, a Venturi tube a liquid jet pump, and a check valve, and cooling means for removing heat from an input liquid, said valve means interruptedly circulating said refrigerant from the valve means through a return line to said cooling means and thence back to said valve means, said refrigerant being vaporized in said heat exchange means, interruptedly condensed in said valve means and intermittently discharged into said return line, a portion of said refrigerant in said return line being returned to said heat exchange means, said steam valve being spring loaded for introducing pressurized vaporized refrigerant from said heat exchange means into said Venturi tube, said liquid jet pump being connected to said return line for introducing into said Venturi tube refrigerant returned from said cooling means to said valve means, said check valve connecting said Venturi tube with said return line and permitting said refrigerant to flow only in the direction from said Venturi tube to said return line, said valve being located at a height above said heat exchange means, wherein heat removal means is provided for removing heat from a second input liquid, said heat removal means comprising an evaporator and an associated throttle valve, said throttle valve



being adapted to receive refrigerant between said cooler and said valve means through an evaporator inlet line, said evaporator being adapted to discharge refrigerant to said valve means through an evaporator outlet line, the method comprising the steps of:

(a) introducing an input fluid containing waste heat into said heat exchange means, said input fluid having a temperature sufficiently high to vaporize and pressurize said refrigerant;

(b) withdrawing said input fluid from said heat exchanger;

(c) introducing a cooling fluid in heat exchange relationship with refrigerant in said cooler;

(d) withdrawing said cooling fluid;

(e) introducing an evaporator fluid in heat exchange relationship with refrigerant in said evaporator; and

(f) withdrawing said evaporator fluid.

4,192,149

POST CONDENSER LOOP CASE HEATER CONTROLLED BY AMBIENT HUMIDITY

William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 18, 1978, Ser. No. 943,607

Int. Cl.² F25D *21/06*

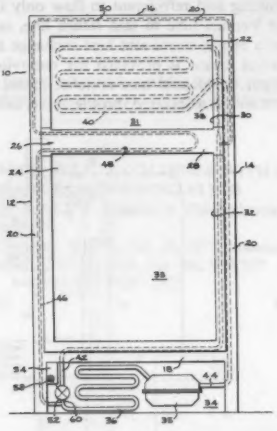
U.S. Cl. 62—151 **9 Claims**

4. A multi-compartment refrigerator cabinet with a front opening including an outer sheet metal shell having top and sidewalls provided with an integral inturned flange at the front turned in substantially at a right angle to the top and sidewalls; a mullion construction extending between said sidewall flanges with said mullion, said top wall flange and the portions of said sidewall flanges above said mullion defining a freezer front door opening, and said mullion and the portions of said sidewall flanges below said mullion defining a fresh food front door opening;

a refrigeration system for said cabinet including a compressor, a condenser, an expansion device and an evaporator arranged in series relation with the condenser being connected to the expansion device by a liquid refrigerant flow line;

valve means in said liquid flow line arranged intermediate said condenser and said expansion device;

an auxiliary liquid line connected in bypass relation to the said valve means in said liquid refrigerant flow line, said auxiliary liquid line being connected into the liquid flow



line in bypass relation with said valve, between the condenser and expansion device, said auxiliary liquid line having a first portion arranged in said mullion and a second portion arranged in said top and sidewall flanges defining said freezer front door opening;

a control means including relative humidity sensing means for causing said valve to close when the relative humidity exceeds a predetermined level so that relatively warm liquid refrigerant will flow through said auxiliary liquid line to transfer heat to said flanges defining said freezer compartment front door opening.

4,192,150

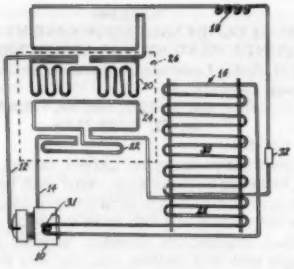
DEFROSTING ARRANGEMENT FOR A REFRIGERATOR

John P. Langan, 599 Springfield Ave., Newark, N.J. 07103, and Michael A. DeCicco, S. Bend, Ind., assignors to John P. Langan, Orange, N.J.

Filed Jun. 24, 1976, Ser. No. 699,340

Int. Cl.[2] F25B *47/00, 41/00*

U.S. Cl. 62—277 **6 Claims**



1. In a refrigeration system including a compressor; a compressor discharge line; a compressor suction line; a condenser; a refrigerant expanding device; and an evaporator; the evaporator being located in a refrigerator compartment, and the condenser, the expanding device and the evaporator being connected in series between said discharge and suction lines in positions wherein the expanding device is upstream with respect to the flow of refrigerant from the evaporator and the condenser is upstream from the expanding device; a heat transfer loop connected between and in series with said discharge line and the condenser to continuously receive hot liquid refrigerant from the compressor during the operation thereof, the loop being disposed in said compartment in contact with evaporator tubing to minimize the accumulation of frost at the evaporator.

4,192,151

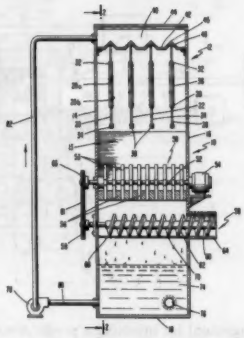
ICE MAKING APPARATUS

C. Donald Carpenter, St. Louis, Mo., assignor to Vivian Manufacturing Company, St. Louis, Mo.

Filed Sep. 7, 1977, Ser. No. 831,296

Int. Cl.[2] F25C *5/02, 5/10*

U.S. Cl. 62—320 **9 Claims**



1. Apparatus for making clear ice, comprising:

plate means for forming ice sheets including,

a pair of vertically oriented outer surfaces, the outer surfaces being generally planar and having an embossed pattern thereon, and

a passageway including an inlet and an outlet, the passageway extending between the outer surfaces of the plate means in a generally tortuous path;

water distribution means for distributing water to the plate means including,

chamber means for holding water, having a bottom member with an inverted "V" shaped portion being positioned above the plate means in close proximity thereto, the inverted "V" shaped portion having a plurality of orifices disposed throughout to provide a generally uniform flow rate of water from the chamber onto the outer surfaces of the plate means while avoiding entrainment of air into the water,

tank means provided below the plate means for collecting excess water from the outer surfaces of the plate means, and

a pump having an inlet in communication with the tank means and an outlet in communication with the chamber means;

sizing means provided between the plate means and the tank means for breaking ice sheets formed on the outer surfaces of the plate means into ice pieces having a predetermined maximum size;

conveying means provided between the sizing means and the tank means for removing the ice pieces from the apparatus; and

refrigerating and defrosting means for supplying a refrigerant

fluid for icemaking and defrosting to the passageway of the plate means to loosen ice therefrom, including

a compressor for pressurizing and raising the pressure and temperature of refrigerant fluid, having an inlet and an outlet,

a condenser for lowering the temperature of compressed refrigerant fluid, having an inlet and an outlet, the condenser inlet being in fluid communication with the compressor outlet, and

conduit means for connecting the plate means outlet with the compressor inlet, selectively operable for connecting the condenser outlet with the plate means inlet during water freezing, and for connecting the compressor outlet with the plate means inlet during ice loosening,

the refrigerating and defrosting means further including a valve provided in the conduit means between the plate means outlet and the compressor, immediately downstream of the plate means outlet and operable between open and closed positions, the open position permitting a flow of refrigerant fluid through the passageway of the plate means and the closed position preventing a flow of refrigerant fluid to increase pressure of the refrigerant fluid within the ice plate means, the pressure acting on the surfaces of the plate means to defrost the ice from the outer surfaces.

4,192,152

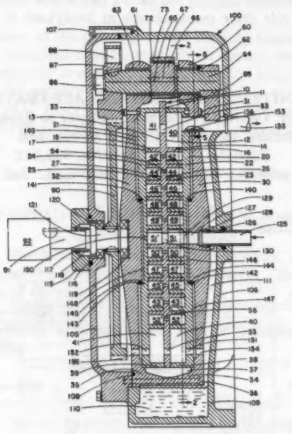
SCROLL-TYPE FLUID DISPLACEMENT APPARATUS WITH PERIPHERAL DRIVE

Allen E. Armstrong, Lexington, and John E. McCullough, Carlisle, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 14, 1978, Ser. No. 896,161

Int. Cl.[2] F01C *1/02, 11/00, 21/00;* F25D *17/00*

U.S. Cl. 62—402 **34 Claims**



1. A positive fluid displacement apparatus, comprising in combination

(a) an orbiting scroll member comprising a plate having mirror-imaged involute wraps affixed to opposite surfaces of said plate and three, equally-spaced peripheral extensions;

(b) first and second oppositely disposed stationary scroll members, each comprising an end plate having an involute wrap affixed thereto engageable with an involute wrap of said orbiting scroll member, whereby when said orbiting scroll member is orbited with respect to said stationary scroll members the flanks of said engaging wraps along with said plate of said orbiting scroll member and the internal facing surfaces of said end plates of said stationary scroll members define mirror-imaged moving pockets of variable volume and zones of high and low fluid pressures;

(c) first and second oppositely disposed stationary scroll support members affixed to said first and second stationary scroll members, respectively, only around their peripheries, each of said support members having three, equally-spaced peripheral projections axially aligned with the peripheral projections of the opposed scroll support member;

(d) three equally spaced crankshafts, each having affixed thereto a satellite gear and each being supported in said axially aligned projections of said opposed scroll support members and rotatable with respect to said stationary scroll members;

(e) an orbiting scroll eccentric affixed to each of said crankshafts and interposed between said peripheral projections;

(f) radially compliant linking means mechanically connecting said orbiting scroll member through said peripheral extension to said eccentrics whereby there is provided a three-link connection around said orbiting scroll member;

(g) fluid passage means in fluid communication with said zones of high and low fluid pressures;

(h) a central gear engageable with said satellite gears and mounted on a rotatable shaft; and

(i) energy converting means connected to said rotatable shaft arranged to either drive said shaft or absorb energy from its rotation.

4,192,153

HOOKES JOINT YOKE

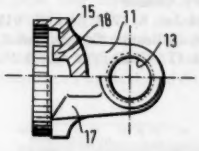
Leslie G. Fisher, Birmingham, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Feb. 8, 1979, Ser. No. 10,385

Claims priority, application United Kingdom, Feb. 23, 1978, 7204/78

Int. Cl.[2] F16D *3/26*

U.S. Cl. 64—17 R **3 Claims**



1. A yoke for a hookes joint, comprising a base and two limbs extending from the base generally parallel to and spaced from the rotational axis thereof and defining apertures for receiving bearings to mount a cruciform member of the joint, wherein the yoke is formed of a lightweight metal and the limbs have generally axially extending edge regions which are provided with reinforcing flanges at least adjacent the base of the yoke, and the dimension of the base of the yoke measured parallel to said axis, at least in the region between adjacent base parts of the opposite limbs, is at least as great as the thickness of the portions of the limbs provided with said reinforcing flanges.

4,192,154

CONSTANT VELOCITY UNIVERSAL JOINT

Yozo Nakamura, and Morio Ohshima, both of Shimoinayoshi, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Japan

Filed Oct. 20, 1977, Ser. No. 844,122

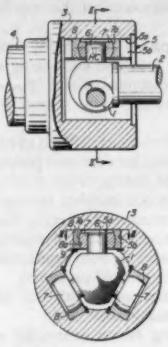
Claims priority, application Japan, Oct. 27, 1976, 51-128381

Int. Cl.[2] F16D *3/30*

U.S. Cl. 64—21 **10 Claims**

1. A three-roller type constant velocity universal joint, comprising a first drive member connected to a first shaft, a second

drive member connected to a second shaft, three radial yoke pins secured to said first drive member offset with respect to each other at equal angles, three inner movable members secured to said yoke pins and axial guide grooves in said second drive member, characterized in that said inner movable members are annular rollers, axially movable on said yoke pins, that three outer movable members are disposed on said inner mov-



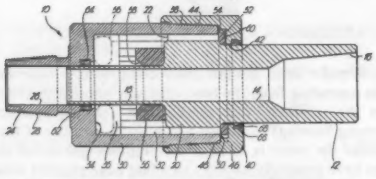
able members to rotate and tilt with outer peripheries of the outer movable members guided in the guide grooves in parallel with the rotational axis of said second drive member, and that an outside peripheral surface of said annular roller and an inside peripheral surface of said outer movable member mate and are both of segmental spherical contours and accommodate the tilting of the rotational axis of said inner movable member.

4,192,155

FLOATING CUSHION SUB

Gary D. Gray, Calgary, Canada, assignor to Brulorne Resources Limited, Calgary, Canada

Filed Jun. 5, 1978, Ser. No. 912,799
Claims priority, application Canada, Jul. 21, 1977, 283305
Int. Cl.[2] F16D *3/06*; E21B *17/00*
U.S. Cl. 64—23 **1 Claim**



1. An axially floating cushion sub for a drill string comprising:

(a) a mandrel having an axially extending through bore, a box end for connection to a pin end of a drill string member, a radially enlarged central portion adjacent said box end, a plurality of circumferentially spaced, axially extending external splines on said central portion, and an axial extension extending from said central portion at the end opposite said box end;

(b) an outer housing having a pin end for connection to a power head of a drill rig, an axially extending through bore in said pin end for receiving said mandrel axial extension therein, a radially enlarged annular portion adjacent the pin end, and a plurality of circumferentially spaced, axially extending internal splines in said annular portion engageable with the external splines of said mandrel central portion;

(c) a cup-shaped cap member having an end wall with a through bore for reception of said mandrel box end, said cap member bring threadably engageable with said outer housing annular portion for retaining said mandrel within said outer housing and for limiting relative axial movement between said mandrel and said outer housing, said cap member having an internal step adjacent said end wall for abutting engagement with an end face of said outer housing annular portion;

(d) a first annular urethane cushion fitting tightly over said mandrel extension and being positioned within an annular cavity formed radially between said mandrel extension and said outer housing annular portion, and axially between said mandrel central portion and said outer housing pin end;

(e) a second annular urethane cushion fitting tightly over said mandrel box end and positioned within a cavity formed radially between said cap member internal step and said mandrel box end;

(f) a wiper ring positioned in an annular recess of said cap member bore for sealing engagement with said mandrel box; and

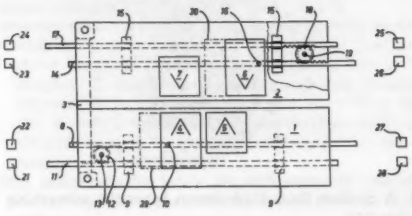
(g) a rod seal positioned in an annular recess of said pin end through bore for sealing engagement with said mandrel extension.

4,192,156

KNITTING METHOD AND APPARATUS

Fritz Kohler, Couvet, Switzerland, assignor to Edouard Dubied & Cie (Société Anonyme), Couvet, Switzerland

Filed Jul. 7, 1978, Ser. No. 922,642
Claims priority, application Switzerland, Jul. 25, 1977, 9173/77
Int. Cl.[2] D04B *7/04*
U.S. Cl. 66—64 **9 Claims**

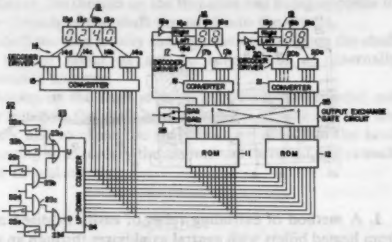


1. The method of obtaining a knit on a knitting machine having at least two needle beds in which needles can slide and at least one knitting carriage including a pair of cam plates each of which has a knitting system mounted thereon comprising the steps of reciprocating said carriage to form rows of stitches and selectively varying the relative position of one knitting system on one cam plate with respect to the knitting system on the other cam plate during displacement of the knitting carriage thereby to change the stitch pattern produced by the machine.

4,192,157
KNITTING WIDTH INDICATION SYSTEM FOR KNITTING MACHINES

Takashi Hida, Toyota; Tsutomu Mitsui, Chiryu; Tadaaki Hashiride, and Kazutaka Kuwana, both of Toyota, all of Japan, assignors to Aisin Seiki Co., Ltd., Japan

Filed Feb. 23, 1978, Ser. No. 880,563
Claims priority, application Japan, Mar. 2, 1977, 52-22927; Mar. 11, 1977, 52-27258; Mar. 15, 1977, 52-28279
Int. Cl.[2] D04B 7/10
U.S. Cl. 66—76 11 Claims



1. A knitting width indication system for knitting machines, comprising:

electronic memory device means for storing a plurality of fabric piece outline data;

pattern width indication display device means for displaying knitting information;

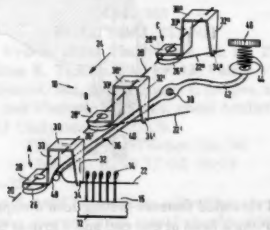
electronic control circuit means for addressing the electronic memory device means, said electronic control circuit means including at least a manually operated switch circuit to set the read out address for the electronic memory device means and a read out address increment circuit which is energized in synchronism with the traversing movement of the carriage of the knitting machine; and

manually operated change over circuit means, responsive to the electronic control circuit means, for selectively supplying the pattern width indication display device means with fabric piece outline data or data representing the stitch difference between successive steps of a fabric piece outline.

4,192,158
WEFT THREAD TENSIONING DEVICE FOR WARP KNITTING MACHINES

Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,778
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2736976
Int. Cl.[2] D04B 15/44
U.S. Cl. 66—146 7 Claims



1. A weft thread tensioning device for a warp knitting machine having a needle bar with a plurality of needles affixed thereon forming a needle bed, at least two guide bars with a plurality of guides affixed thereon and a magazine insertion device for inserting weft threads by presenting said threads to said needle bed, comprising:

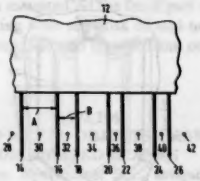
(a) means of testing the tension of said weft threads, prior to presentment to said needle bed; and

(b) means for tensioning said weft threads just prior to presentment to said needle bed to a predetermined amount when said threads are below said predetermined tension amount.

4,192,159
APPARATUS FOR THE PRODUCTION OF LOOP PILE WARE ON WARP KNITTING MACHINE

Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,690
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722253; Jul. 21, 1977, 2732968
Int. Cl.[2] D04B 23/00, 27/00
U.S. Cl. 66—203 4 Claims

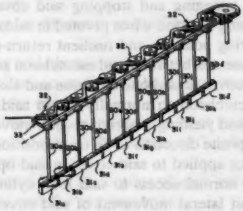


1. In a warp knitting machine utilizing a plurality of threads for the production of loop pile ware, said threads being at least pile loop threads, pillar loop threads and weft threads, and having a sinker bar with a plurality of sinkers affixed thereon, said sinkers being unequally spaced on said sinker bar, a larger space passing therethrough a plurality of threads and a smaller space passing therethrough a single thread during stitch formation.

4,192,160
FABRIC AND APPARATUS AND METHOD FOR MAKING SAME

Daniel Duhl, New York, N.Y., and Denton B. Wall, Tarboro, N.C., assignors to Polylok Corporation, New York, N.Y.

Division of Ser. No. 810,874, Jun. 28, 1977, Pat. No. 4,144,727.
This application Sep. 11, 1978, Ser. No. 941,258
Int. Cl.[2] D04B 23/00, 27/00
U.S. Cl. 66—207 25 Claims



1. An apparatus for guiding a plurality of warp yarn design elements onto a flexible substrate in a twisted and aesthetically pelasing configuration at spaced intervals along the warp di-

rection in a stitch-through type machine such as a Malimo machine, comprising:

a shaft rotatable about its longitudinal axis and linearly movable in the direction of said axis; and

a guide bar having a plurality of spaced-apart warp yarn design element guides joined to the shaft at an angle and rotatable with the shaft about the axis,

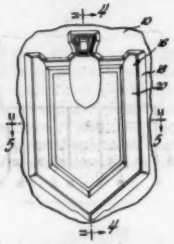
said apparatus being adapted to be mounted on the machine and rotatably disposed with respect to the longitudinal axis of the shaft.

4,192,161

ESCUTCHEON AND COVER ASSEMBLY FOR A LOCK CYLINDER

Hans J. Borlinghaus, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1978, Ser. No. 943,450
Int. Cl.² E05B 17/18
U.S. Cl. 70—455 **3 Claims**



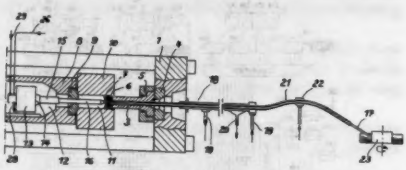
1. An escutcheon and cover assembly for a lock cylinder mounted in a vehicle body trunk lid, said assembly comprising an escutcheon having a plurality of attaching locations to which access must be had to secure the escutcheon to the vehicle body trunk lid, said escutcheon having a face with an opening therethrough for providing access to the lock cylinder, a cover, means mounting the cover on the escutcheon for pivotal movement across said face and lateral movement to a limited extent away from said face, said cover and escutcheon having first cooperating stop means for normally engaging and stopping said cover in a closed position covering both said opening and said attaching locations when said cover is pivoted in one direction while being retained in juxtaposed relationship with said face but disengaging and permitting said cover to continue pivoting in said one direction to an escutcheon attaching position uncovering all of said attaching locations when said cover is moved away from said face a limited extent, said cover and escutcheon having second cooperating stop means for engaging and stopping said cover in said escutcheon attaching position when pivoted in said one direction from said covering position, and resilient return-detent means operatively connected between said escutcheon and said cover for biasing said cover in said one direction and also against said face of said escutcheon to normally retain said cover in its closed position and yieldingly permit pivotal movement of said cover in the opposite direction to an open position in response to a pivotal force applied to said cover in said opposite direction to provide normal access to said lock cylinder and also yieldingly permit lateral movement of said cover away from said face to disengage said first cooperating stop means in response to a lateral force applied to said cover and then force pivotal movement of said cover in said one direction to said escutcheon attaching position to provide access to said attaching locations.

4,192,162

METHOD AND APPARATUS FOR THE EXTRUSION OF TUBES OF EASILY OXIDIZED MATERIALS

Franz-Josef Zilges, Monchen-Gladbach, and Heinrich Kutz, Neuss, both of Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,773
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739800
Int. Cl.² B21B 45/02
U.S. Cl. 72—45 **3 Claims**



1. A method of extruding tubes of easily oxidised material from heated billets with central axial bores through an annular gap formed by an extrusion die and the tip of a hollow mandrel positioned in the die aperture, the method comprising the following steps:

placing the billet in a billet container of an extrusion press;

pressing the mandrel into the billet along the bore thereof, the mandrel having a diameter greater than the diameter of the bore so that the bore is widened as the mandrel is pressed in;

terminating the preceeding step once the leading end of the mandrel has entered the die aperture;

extruding the billet;

blowing protective gas into the interior of the extruded hollow tube through the mandrel; and

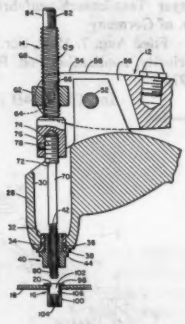
cooling the extruded tube in a cooling section arranged immediately downstream of the die around the outside of the tube, with the protective gas remaining inside the tube up to the end of the cooling section distal from the die.

4,192,163

TOOL FOR SETTING BLIND FASTENERS

Alan Martin, 44 Lantern La., Sharon, Mass. 02067

Filed Nov. 20, 1978, Ser. No. 961,869
Int. Cl.² B21J 15/34
U.S. Cl. 72—114 **4 Claims**



1. A blind threaded fastener setting tool comprising:

a frame having a head at one end and a grip at the other end,

an opening extending through the head generally perpendicular to the grip,

a pivot post on the frame adjacent the opening,

a lever pivotally mounted on the pivot post and having a grip extending generally is the same direction with respect to the pivot post as the frame grip,

a cradle pivotally carried by the lever on the side of the pivot post corresponding to that of the head,

a shaft threaded through the cradle and extending through the opening in the head, said shaft being pulled in one direction out of the opening when the grips are squeezed together and being moved in the opposite direction when the grips are spread apart,

said shaft having a threaded end portion extending through the opening in the head for screwing into a blind threaded fastener, the threads on the threaded end being opposite to the threads of the shaft threaded into the cradle,

said shaft moving axially through the cradle when the shaft is rotated about its axis to screw into an internally threaded fastener,

and means on the shaft at its end opposite the threaded end for rotating the shaft in the cradle to screw into the fastener and to cause the shaft to move axially in the head opening so as to vary the amount the threaded end extends out of said opening.

4,192,164

ROLLING MILLS

Hans Brauer, Leichlingen, Fed. Rep. of Germany, assignor to Friedrich Kocks GmbH & Company, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,731

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732496

Int. Cl.[2] B21B *1/18*

U.S. Cl. 72—234 **14 Claims**

1. A rolling mill for the single-strand rolling of bar sections which rolling mill has successively one behind the other in a straight rolling line at least one multi-stand roughing block for the purpose of main deformation and a finishing block for after-sizing, the cross section of the work-material beyond the last roughing stand being substantially the same as its finished cross section, in which the rolls of at least the two last stands before the entry end of the finishing block are adjustable radially of the run-through axis of the work-material, and the rolls of the finishing block are not adjustable, the latter being provided with driving means for driving the rolls at speeds which do not change during a given run but which may be changed upon a change of dimensions between runs, and in which the entire reduction in the cross section in the finishing block does not fluctuate between more than approximately 2 and 12%, only ⅓ to ⅔ of this reduction being applicable to the nominal reduction of the cross section, and the remaining available reduction serving to compensate for cross-sectional irregularities, and the rolling sizing passes of the finishing block are interchanged upon each change of shape and/or dimension between runs whereas the rolling sizing passes of the roughing stands or roughing blocks only having to be changed upon a change of area exceeding approximately 8% to 15% between runs.

4,192,165

ROLL MILL STAND

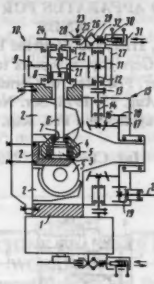
Vladimir N. Vydrin, ulitsa Timiryazeva, 28, kv. 27; Leonid A. Barkov, ulitsa K. Tsetkin, 30a, kv. 13; Valery V. Pastukhov, ulitsa Stalevarov, 28a, kv. 79; Sergei I. Dolgov, ulitsa Lenina, 68, kv. 20, and Vladimir S. Sysoev, ulitsa Artilleriiskaya, 65b, kv. 6, all of Chelyabinsk, U.S.S.R.

Filed Jan. 2, 1979, Ser. No. 94

Int. Cl.[2] B21B *31/08, 35/14*

U.S. Cl. 72—238 **3 Claims**

1. A roll mill stand comprising: a housing; chocks mounted on said housing; journals fixed in said chocks; work rolls forming a pass supported by said journals; a drive means for rotating at least one of said work rolls; a spindle connected by one of its ends to one of said work rolls; a pinion connected by a splined joint to the other end of said spindle and geared to said drive means; a device for axial displacement of said spindle intended to disconnect said spindle from one of said work rolls and comprising: a motion screw mounted in-line with said spindle and connected to its other end, a nut of said motion



screw mounted on the hub of said pinion for rotation with respect to said nut, a disk fixed to an end face of said nut, a braking mechanism mounted on the fixed part of said roll mill stand and cooperating with said disk of said nut as said nut is being braked to disengage said spindle from one of said work rolls.

4,192,166

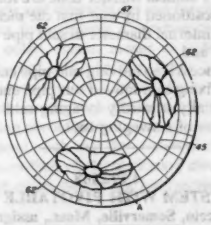
DECORATED METAL OBJECTS DRAWN FROM DECORATED BLANKS

Robert M. Johnson, Providence, R.I., assignor to Reed and Barton Corporation, Taunton, Mass.

Filed Dec. 19, 1977, Ser. No. 861,612

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—347 **7 Claims**



1. The method of making a shaped metal object drawn from a sheet metal blank of a base metal having thereover a design in one or more decorative metals, said method comprising:

(a) providing a flat metal blank of a size suitable for forming said object,

(b) forming on said blank an undistorted grid of intersecting lines,

(c) drawing said blank into the shape of said object to distort the grid lines according to the deformation of the metal in forming the object,

(d) preparing a flat representation of at least that portion of the distorted grid on the portion of the object surface to be decorated,

(e) applying at least the outline of each color of the desired design to said flat representation,

(f) transferring the design from said representation to said undistorted grid by locating portions of the design intersecting the distorted grid line intersections at the corresponding grid line intersections on the undistorted grid, thereby forming a distorted design,

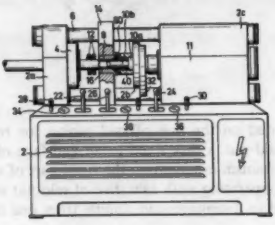
(g) reproducing said distorted design in decorative metal on a flat blank of said base metal, and
(h) drawing said decorated blank to form said object.

4,192,167

PROCESS AND APPARATUS FOR UPSETTING PIPE ENDS

Bernhard Huebner, Trier, and Dietfried Tresser, Gusterath, both of Fed. Rep. of Germany, assignors to Laeis-Werke Aktiengesellschaft, Trier, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,920
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812803
Int. Cl.² B21D *22/00*
U.S. Cl. 72—356 **8 Claims**



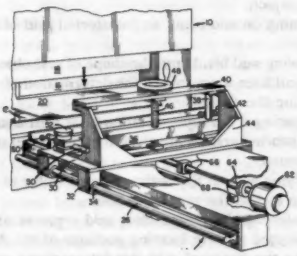
1. A process for upsetting pipe ends, in particular ends of drill pipes forming tool joints comprising the steps of
fixedly positioning a pipe end of a drill pipe having a predetermined internal diameter into fixed first die means, said pipe end and first die means defining a free annular space therebetween;
in a first process step axially moving a mandrel toward said pipe end fixedly positioned in said first die means to thereby deform said pipe end by upsetting it and at least partially fill said annular space so that a cylindrical pipe section and a conical transfer zone are formed in said pipe end when positioned by said first die means and said predetermined internal diameter in said pipe and pipe end are maintained; and
in a second process step moving said pipe end out of said first die means, fixing said moved out pipe end in position and at least partially inwardly swaging said moved out pipe end by means of a swaging tool.

4,192,168

GAGING SYSTEM WITH PIVOTABLE GAGE BAR

James J. Di Ciaccio, Somerville, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jan. 4, 1979, Ser. No. 903
Int. Cl.² B21D *11/22*
U.S. Cl. 72—389 **11 Claims**



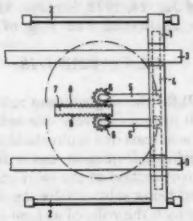
1. For use in a gaging system employed with a sheet forming machine and having a table movable along a travel path, a gage bar assembly mounted on the table, said assembly comprising:
an elongated gage bar attached to the table and having a gaging surface against which a sheet can be positioned, and a longitudinal axis about which the bar is symmetrically disposed;
support arms each attached at one end to the table and each pivotally attached at the opposite end to the gage bar;
means for pivotally attaching the gage bar to the confronting support arm ends at a pivot axis disposed at the longitudinal axis thereof; and
a biasing mechanism coupling the pivotal end of each support arm and the gage bar and operative to urge the bar to a rest position in the absence of an upward force applied to the gaging surface of the bar.

4,192,169

APPARATUS FOR DRIVING A PAIR OF GRIPPER BARS IN A LONGITUDINAL DIRECTION

Werner Münch, and Gerald Mikusch, both of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 940,092
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740211
Int. Cl.² B21D *43/05*; B65G *25/04*
U.S. Cl. 72—405 **5 Claims**



1. An apparatus for driving a pair of gripper bars of a multistage press in a longitudinal direction of the press, the apparatus including a pair of driven levers disposed symmetrically to a longitudinal center plane of the press and being rotatable in unison over a turning path of 180°, a slide guide means extending at right angles to the longitudinal direction of the press, the pair of driven levers being operatively connected to the slide guide means, characterized in that at least one feed cross member is operatively connected to a pair of gripper bars and to the slide guide means, two toothings are provided and disposed symmetrically with respect to the longitudinal center plane of the press, the two toothings are mounted so as to be conjointly reciprocatorily driven between two end positions, a rotatably mounted pinion is provided for engaging each of the two toothings, each of the pinions have a rotational path of 180° between the two end positions of the toothings, and in that each of the pinions is rotatably mounted at one end of the pair of driven levers.

4,192,170

DRAWING DIE FOR MAKING A PIPE ELBOW

Josef Ferwagner, Hofleite 8, 4630 Bochum, Fed. Rep. of Germany

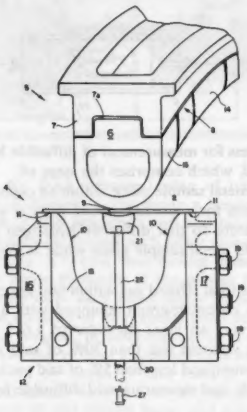
Filed Dec. 12, 1978, Ser. No. 968,865
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757658
Int. Cl.² B21D *11/20*
U.S. Cl. 72—414 **10 Claims**

1. A die assembly for making a tubing elbow, said assembly comprising:
an upper die half including

an upper arcuate relatively long holder,

a plurality of relatively short and arcuate upper die sections secured in an upper row to said upper holder and having arcuate and downwardly convex lower faces together forming an elongated and substantially continuous downwardly convex arcuate lower surface, and

an upper end section at each end of said upper row and each having a generally semicylindrical downwardly convex face forming a continuation of said lower surface; and a lower die half comprising



a lower arcuate relatively long U-section holder,

a plurality of relatively short and arcuate lower die sections secured in a lower row to said lower holder and having arcuate and upwardly concave upper surfaces together forming an elongated and substantially continuous upwardly concave arcuate upper surface, and

a lower end section at each end of said lower row and each having a generally semicylindrical upwardly concave face forming a continuation of said upper surface, said upper sections being receivable within said lower sections.

4,192,171

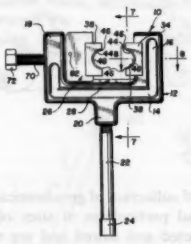
HAND HELD CRIMPING TOOL

Jerry W. Hamilton, Desoto, Tex., assignor to Automatic Tool Company, Inc., Ferris, Tex.

Filed Mar. 23, 1978, Ser. No. 889,317

Int. Cl.[2] B21D *7/00, 37/10*

U.S. Cl. 72—416 **4 Claims**



1. A device for crimping a rigid, tubular ferrule for securing a coupling to a flexible hose comprising: support means a central web on said support means; a guide track extending longitudinally of said web; a first jaw on said support means, said first jaw extending outwardly from said web; a flange on said support means, said flange extending outwardly from said web in spaced relation from said first jaw; a second jaw; means moveably securing said second jaw to said guide track; means secured between said flange and said second jaw for moving said second jaw along said guide track; a saddle formed in each of said first and second jaws, each of said saddles having a pair of spaced shoulders adjacent ends thereof; a pair of crimping dies, each of said crimping dies having a groove formed therein so as to provide spaced projections extending along edges of each of said dies, said saddles and said grooves being complimentary such that opposite ends of said dies engage said shoulders to limit movement of said dies in a first direction and such that said projections engage said jaws adjacent opposite sides of said saddles to limit movement in a second direction; and locking means detachably securing said crimping dies in said saddles.

4,192,172

FORGING MACHINE TRANSFER FOR HEAVY WORKPIECES

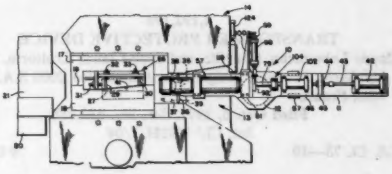
Leo D. Mersek, Richmond Heights, and Peter P. Rettig, Willoughby, both of Ohio, assignors to The Ajax Manufacturing Company, Cleveland, Ohio

Continuation of Ser. No. 622,080, Oct. 14, 1975, abandoned.

This application Apr. 13, 1978, Ser. No. 896,005

Int. Cl.[2] B21D *43/05, 43/06, 43/10, 45/06*

U.S. Cl. 72—420 **20 Claims**



1. A transfer mechanism for moving relatively large workpieces through the die stations of a horizontal forging machine having a stationary and movable die and forging dies, comprising: collet means for gripping a workpiece, a platform for supporting said collet means, means to index longitudinally along an axis thereof said platform while said collet means grips the workpiece to transfer the workpiece in one direction from a loading station through successive forging die stations, said platform being pivotal about such axis, and means to swing said platform about such axis for removal of the workpiece from within the confines of the stationary die, and the longitudinal axis of said collet means not intersecting the axisof said means to index.

4,192,173

ECCENTRIC PIN MOUNTING SYSTEM

Leo E. Ay, San Juan Capistrano, and Ramon E. Arriaza, Fountain Valley, both of Calif., assignors to Pacific Scientific Company, Anaheim, Calif.

Filed Jul. 26, 1978, Ser. No. 928,194

Int. Cl.[2] G01M *19/00*

U.S. Cl. 73—11 **26 Claims**

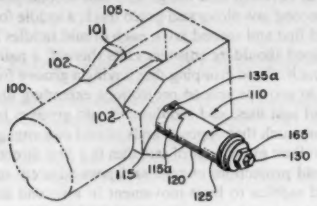
1. A mounting device supporting a motion snubber useful for inducing motion in said snubber to permit testing of the snubber in place comprising:

pin means supporting said snubber including a main portion to be disposed within pin supporting structure where said snubber is mounted;

a movable portion disposed axially adjacent said main portion and within a mounting element on said snubber, movable between a concentric position and an eccentric position with respect to said main portion while supporting said snubber;

means formed in said pin means for guiding the movement of

said movable portion between said concentric position and said eccentric position; and



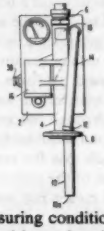
means for affixing the position of said movable portion in said eccentric position or in said concentric position.

4,192,174

TRANSFORMER PROTECTIVE DEVICE

Claude Lobermann, Chaville, and Jean-Claude Croitoriu, Viroslay, both of France, assignors to Automation 2000 S.A., Chaville, France

Filed Oct. 6, 1977, Ser. No. 839,888
Int. Cl.[2] H02H 7/04
U.S. Cl. 73—19 **9 Claims**



1. Apparatus for measuring conditions in a liquid dielectric filled transformer, comprising: a housing;

generally elongated cylindrical means fixed to said housing and having one closed end and a second end which is adapted to be in open communication with dielectric liquid in the interior of the transformer casing;

a member fixed to said housing and having one end adapted to extend into the transformer casing;

first indicating means contained in said generally cylindrical means for measuring gas emission levels in the transformer casing and for providing an indication of said gas emission levels;

first detecting means coupled with said generally cylindrical means for detecting predetermined variations in the internal pressure of said transformer casing;

second detecting means coupled with said member extending into the transformer casing for detecting changes in the temperature of the dielectric in said transformer casing; and

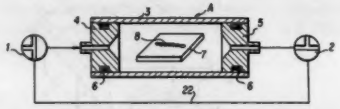
second indicating means fixed to said housing and coupled with said second detecting means for providing a visual indication of said temperature changes.

4,192,175

PROCESS AND APPARATUS FOR MEASUREMENT OF DIFFUSIBLE HYDROGEN

Tomokazu Godai; Tohru Sugiyama, both of Kamakura; Morihiko Sugino; Masaru Kondo, both of Fujisawa, and Tsuneshi Ogawa, Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Mar. 3, 1978, Ser. No. 883,235
Int. Cl.[2] G01N 7/14
U.S. Cl. 73—19 **4 Claims**



1. A process for measurement of diffusible hydrogen within a solid metal, which comprises the steps of:

placing a metal sample piece within an enclosed gas collecting means for a predetermined time at a predetermined temperature so that diffusible hydrogen may be effused from said metal sample piece while in the solid state; and then

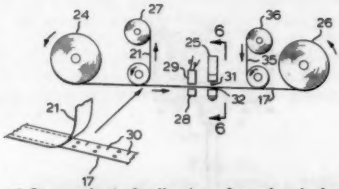
feeding the total effused gas within said gas collecting means to a gas chromatograph equipped with a separation column having an inner diameter of 1.6–7 mm containing packing wherein less than 30% of said packing is finer than 35 mesh and less than 5% of said packing is finer than 150 mesh, and measuring said diffusible hydrogen.

4,192,176

DETECTION OF CONCEALED METALLIFEROUS DEPOSITS, HYDROCARBONS AND EXPLOSIVES

Anthony R. Barringer, Golden, Colo., assignor to Barringer Research Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 679,622, Apr. 23, 1976, Pat. No. 4,056,969. This application Nov. 3, 1977, Ser. No. 848,054
The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.
Int. Cl.[2] G01N 15/00
U.S. Cl. 73—28 **22 Claims**

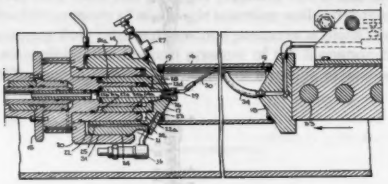


1. In a method of collection of geochemical samples wherein samples of surficial particulates of sizes of above about 50 microns are collected and stored and are subsequently analyzed for content of predetermined elements or compounds, said particulates being deposited at predetermined locations in a thin layer on a storage medium, the improvement wherein prior to the analysis of the particulates, the particulates are crushed while on said storage medium to thereby fracture the particulates into fine fragments to facilitate subsequent analysis and to render said samples more homogeneous.

4,192,177
APPARATUS AND METHOD FOR PRESSURE TESTING OF TUBULAR BODIES

James L. Crickard, Huntington, W. Va., and Harold L. Sheets, Chesapeake, Ohio, assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Jan. 9, 1978, Ser. No. 867,820
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—49.5 10 Claims



1. Apparatus for fluid pressure testing of tubular bodies having a range of diameters comprising a headstock, a tailstock, with each of said headstock and said tailstock having convex faces projecting toward each other along a common axis, and a plurality of O-ring seals having diameters corresponding to the inside diameters of the tubular bodies to be tested, said convex faces each being larger in base diameter than the internal diameter of any tubular body to be pressure tested and being adapted, in combination, to hold a tubular body therebetween and to form a pressure-tight seal therewith at the ends thereof by means of said resilient O-ring seals placed within said tubular body at each junction of said convex faces and the ends of said tubular body, said headstock comprising telescoping rearward and forward elements with said rearward element being fixably mounted and with said forward element bearing said convex face, said headstock convex face having at least one sensing hole communicating from a location within the internal diameter of a tubular body to be tested in place thereon through said forward telescoping element to the junction between said telescoping elements whereby fluid pressure communicating from said sensing hole to said junction acts hydraulically to urge said forward telescoping element away from said rearward telescoping element and against the end of said tubular element in contact with said convex face of said forward telescoping element during test to hold said O-ring seals closed against the opposing action of testing fluid within said tubular body.

4,192,178
APPARATUS FOR DETERMINING STAGNATION PRESSURE, STATIC PRESSURE, PITCH ANGLE, AND YAW ANGLE OF ELASTIC FLUID

John S. Wyler, Andover, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1978, Ser. No. 920,580
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 3 Claims

1. An apparatus for measuring the stagnation pressure and yaw angle and providing indications of static pressure and pitch angle at any point in an elastic fluid stream, said apparatus comprising:

probe means for gradually deflecting, when inserted in an elastic fluid stream, a portion of the elastic fluid from its normal flow direction through an angular displacement causing compression and deceleration of the deflected fluid while restraining formation of interfering shock waves therein, said fluid deflection terminating in a region of fluid stagnation, said probe means being insertable into said fluid stream for selected distance so as to be exposable to any point within the fluid stream;

first pressure measuring means in fluid communication with the fluid stagnation region for measuring the stagnation pressure of the elastic fluid stream;

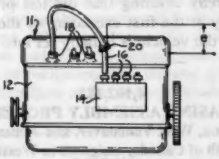
second pressure measuring means in fluid communication with the deflected fluid portion upstream from the stagnation region for measuring a single pressure which is indicative of the static pressure and pitch angle of the elastic, undeflected fluid stream; and

third and fourth pressure measuring means in fluid communication with selected areas of said probe means for measuring the pressures in those areas and providing indications of said probe means' yaw position which is related to and provides a measurement of the undeflected fluid stream's yaw angle.

4,192,179
PIEZOELECTRIC TRANSDUCER FOR FUEL INJECTION ENGINE

Edward Yelke, 945 S. Kensington, La Grange, Ill. 60525

Filed Oct. 6, 1978, Ser. No. 949,061
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A 3 Claims



1. A pressure transducer for sensing the injection of fluid through a tubular line comprising in combination; a clamp formed essentially as a flexible collar of low mass for mounting around the line, discrete sections of piezoelectric material positioned on the inner surface of the collar; said piezoelectric material sections being contoured to bear against the line at areas around the circumference of said line, and said piezoelectric material sections each generating an electrical signal dependent on the pressure exerted on the line by the fluid passing through said line, and an electric connector connecting said piezoelectric material sections to associated electronic circuitry.

4,192,180

TESTING APPARATUS FOR AN ANTI-LOCK CONTROL SYSTEM

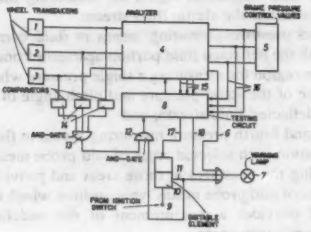
Jürgen Gerstenmeier, Waldhilsbach; Hermann Klotz, Schwetzingen, and Heinz Leiber, Leimen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 773,253, Mar. 1, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 920,308

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612471

Int. Cl.[2] G01L *5/28*

U.S. Cl. 73—121 7 Claims



1. A testing apparatus for an anti-lock control system for vehicle brakes, for testing the correct functioning of the control system, the control system including at least one vehicle related speed sensor, which senses an increasing vehicle speed, and means for analyzing the output signal from the speed sensor, the testing apparatus comprising the following switching devices:

(a) test signal producing means connected to the means for analyzing, for producing a test signal which is delivered to the means for analyzing to initiate a test procedure, said test signal producing means including means for receiving the output of the means for analyzing to determine the correctness of said output; and

(b) first triggering signal producing means connected to the speed sensor and to the test signal producing means, for producing a triggering signal in response to the output of the speed sensor, when a predetermined speed as sensed by the speed sensor is exceeded, and delivering the triggering signal to the test signal producing means for triggering, said first triggering signal producing means including switch means responsive to actuation of the vehicle ignition switch and responsive to the test signal producing means, thereby ensuring that the test procedure is performed only at the first exceeding of the predetermined speed after the vehicle is initially set into operation.

4,192,181

CASING ASSEMBLY PROBES

Franklin D. Patton, West Vancouver, and James D. McFarlane, Vancouver, both of Canada, assignors to Westbay Instruments Ltd., West Vancouver, Canada

Filed Nov. 13, 1978, Ser. No. 959,915

Int. Cl.[2] E21B *49/00*

U.S. Cl. 73—155 13 Claims

1. A probe for use in casing assemblies having ports therein at different levels through which samples and/or measurements can be taken from the environment around the casing at said ports, said probe comprising

an elongate body having an upper end to be connected to suspension means through which fluids and data and operating power can flow to and from the body,

a port in the body,

stop means on the body to co-operate with stop means on the casing assembly in which the probe operates at each level to stop the probe with the body port in registry with the casing assembly port at said each level,

sealing means at the body port to isolate said body port from the interior of the casing assembly when the body port is in registry with a casing port, and

pressure means selectively operable to press said sealing means into engagement with the casing when said ports are in registry,

whereby samples and/or measurements can be selectively taken from outside the casing assembly and through the registering ports within contamination or interference by conditions at any other of said casing assembly ports.

4,192,182

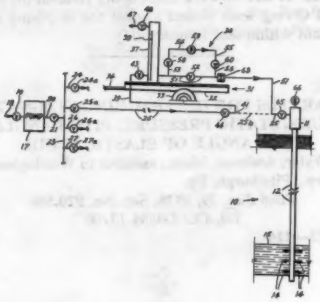
METHOD FOR PERFORMING STEP RATE TESTS ON INJECTION WELLS

G. Clay Sylvester, 4101 Skyline, Midland, Tex. 79703

Filed Nov. 16, 1978, Ser. No. 961,055

Int. Cl.[2] E21B *47/06*

U.S. Cl. 73—155 9 Claims



1. Method for performing step rate tests on injection wells of the type into which water is injected by an injection pump to drive petroleum materials through a subterranean formation toward a production well, there being plural conduit means each leading from a manifold at said injection pump to an injection well, comprising breaking one of said conduit means leading from said injection pump to a single injection well, connecting a portable pumping unit across said break in series with said one conduit, controlling the pressure of water delivered by said injection pump through said one conduit means to the inlet of said portable pumping unit, operating said portable

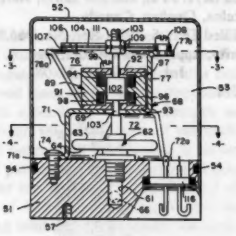
pumping unit to increase the pressure of said water delivered thereto from said controlled pressure to an injection pressure, delivering said water at said injection pressure through said single injection well into said formation while monitoring at least one of the flow rate and injection pressure thereof until the flow rate and injection pressure become at least substantially constant, repeating the described injection procedure at different flow rates and injection pressures below and above the fracture pressure of said single injection well and determining constant flow rates and injection pressures at plural levels, and determining the fracture pressure of the formation from the difference in flow rates at different injection pressures.

4,192,183

PRESSURE RATIO TRANSDUCER SYSTEM

Cosmo L. Avellis, Northridge; Carlo Pavone, Los Angeles, and Albertus Wolfkamp, Canoga Park, all of Calif., assignors to Edcliff Instruments, Monrovia, Calif.

Filed Feb. 17, 1978, Ser. No. 878,676
Int. Cl.[2] G01C *21/10*; G01L *9/10*
U.S. Cl. 73—182 **15 Claims**



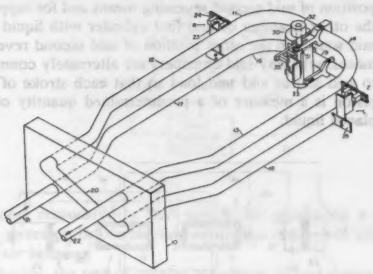
15. In an aircraft pressure transducer system for providing an output signal corresponding to $(P_t - P_s)/P_s$, where P_t is the total pressure in the pitot system and P_s is the static air pressure at the altitude of the aircraft: first and second transducers each comprising a base, a pressure responsive movable member mounted on the base and forming one wall of a chamber to which input pressure is applied, a rigid frame having a generally planar central portion parallel to the base with first and second groups of generally planar legs extending from the central portion toward and away from the base, means securing the free ends of the first group of legs to the base, an output coil mounted on the central portion of the frame in axial alignment with the movable member, a core for varying the inductance of the coil, an axially movable rod carrying the core and connected to the movable member for varying the position of the core in accordance with the pressure applied to the movable member, and a resilient member secured to the outer ends of the second group of legs and connected to the core for yieldably urging the core toward a predetermined rest position; an oscillator connected to the transducer coils for energizing said coils with an electrical signal of predetermined frequency; means for applying the total pressure and the static pressure to the first transducer to produce an output signal in the coil therein corresponding to $P_t - P_s$; means for applying the static pressure to the second transducer to produce an output signal in the coil therein corresponding to P_s, and electronic signal processing means having no moving parts responsive to the transducer output signals for delivering an output signal corresponding to $(P_t - P_s)/P_s$.

4,192,184

MASS FLOWMETER

Bruce M. Cox, Duncan, Okla., and Morris D. Ho, Walnut Creek, Calif., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 13, 1978, Ser. No. 960,518
Int. Cl.[2] G01F *1/84*
U.S. Cl. 73—194 B **20 Claims**



1. In a mass flow rate meter of the coriolis force type having a support, a U-shaped tube including two side legs joined by a cross member with the free ends of the side legs attached to said support and forming an inlet and an outlet for flowable material flowing through said U-shaped tube, and a means for vibrating the bight end of said U-shaped tube perpendicular to the plane of the U-shaped tube, the improvement comprising:

sensor means on each of the side legs of said U-shaped tube for sensing the time difference between one of the legs crossing a predetermined point in the path of the oscillation caused by said vibrating means and the other of the legs crossing said predetermined point of oscillation for giving an indication of the mass flow of the material flowing through said U-shaped tube;

indicating means in said sensor means for indicating the first side leg to cross said predetermined point of oscillation; and

selecting means responsive to said indicating means for selecting one of giving a time representation equal to the sum of the time difference between crossing of said predetermined point of oscillation of said legs during the previous half cycle of oscillation and the time difference for crossing said predetermined point during the present half cycle, and giving a time representation equal to the absolute value of the subtraction of the time difference between crossing of said predetermined point of oscillation of said legs during the previous half cycle of oscillation from the time difference during the present half cycle depending on said side leg which crosses said predetermined point of oscillation first, thereby giving an indication of the mass flow of the material flowing through said U-shaped tube.

4,192,185

FLOWMETER FOR LIQUIDS

Friedrich Keilholz, Ennepetal, Fed. Rep. of Germany, assignor to Ludwig Peithmann KG, Bunde, Fed. Rep. of Germany

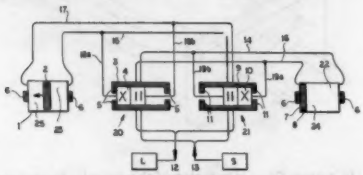
Filed Mar. 1, 1978, Ser. No. 882,419
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708955
Int. Cl.[2] G01F *3/14*
U.S. Cl. 73—243 **9 Claims**

1. A flowmeter for measuring the throughput of a liquid from a source to a load, said flowmeter comprising:

at least a first and a second measuring cylinders, each provided with a respective free floating piston subdividing same into two chambers;

at least a first and a second two-position reversing means for controlling the movement of said pistons, said first revers-

ing means being connected to said second cylinder for supplying one of the chambers thereof with liquid from said source in one position of said first reversing means and for supplying the other of the chambers of said second cylinder with liquid from said source in the other position of said first reversing means, said second reversing means being connected to said first cylinder for supplying one of the chambers thereof with liquid from said source in one position of said second reversing means and for supplying the other chamber of said first cylinder with liquid from said source in the other position of said second reversing means, whereby said chambers are alternately connected to said source and said load so that each stroke of each piston is a measure of a predetermined quantity of displaced liquid;



means associated with each of said reversing means for temporarily retaining each of said reversing means in each of its positions; and

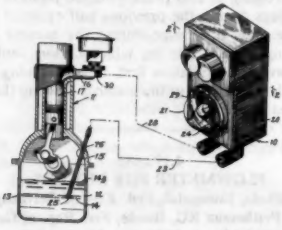
counting means associated with both of said cylinders, responsive to the strokes of each piston for signaling the quantity of displaced liquid, the first and second reversing means being constituted respectively as a first control cylinder receiving a first control piston and a second control cylinder receiving a second control piston, said first control cylinder being formed as part of said second measuring cylinder and said first control piston being formed as part of said second flating piston, the first measuring cylinder being formed with said second control cylinder and the first floating piston being formed with said second control piston.

4,192,186

FLUID LEVEL AND VISUAL INSPECTION DEVICE

James R. Quinn, 2723 W. Kalamath, Kennewick, Wash. 99336

Filed Sep. 28, 1978, Ser. No. 946,507
Int. Cl.[2] G01F *23/00*
U.S. Cl. 73—303 **17 Claims**



1. A fluid level and visual inspection device for internal combustion engines having a fluid sump and a vacuum system whereby air is drawn into the engine, said device comprising:

a housing;

a fluid viewing chamber within the housing;

a fluid conduit having one end in open communication with the fluid viewing chamber and a remaining open end adapted to be submerged within a fluid held within a sump of an engine;

a vacuum air conduit having one end in open communication with the fluid viewing chamber and a remaining open end adapted to be connected to the vacuum system of an associated engine;

valve means operatively connected to the vacuum air conduit for selectively opening and closing the vacuum air conduit so that when the vacuum air conduit is opened, vacuum pressure may be applied within the viewing chamber, thereby causing fluid to be drawn into the viewing chamber; and

means for selectively illuminating the fluid viewing chamber; and

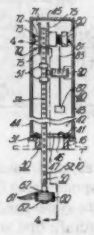
a siphon tube extending along the fluid conduit to an open lower end above the open end of the fluid conduit and having an upper end in open communication with the fluid viewing chamber.

4,192,187

FLOAT CONTROLLED VOLUMETRIC GAUGE

Russell J. Kennedy, 2 Grenville Rd., Kingston, Ontario, Canada (K7M 2C5); Samuel S. Lazier, 239 Albert St., Kingston, Ontario, Canada (K7L 3V4), and Joe Zorzi, 1601 Peel St., City of Two Mountains, Quebec, Canada

Filed Dec. 6, 1978, Ser. No. 966,982
Claims priority, application Canada, Dec. 6, 1977, 292519
Int. Cl.[2] G01F *23/08*
U.S. Cl. 73—321 **9 Claims**



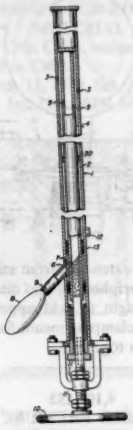
1. Apparatus for measuring changes in the volumetric content of a storage tank wherein such storage tank has a predetermined relationship between changes in liquid level and the change in volumetric content, said apparatus comprising a housing having means to mount the same on the top side of the tank over an opening in such tank, a rotatable tape storage means in said housing, a tape having one end thereof wound onto said rotatable tape storage means and the other end thereof attached to a float located in said tank, said tape being withdrawable from and retractable into said storage means in response to movement of the float caused by a change in liquid level in the tank, guide means in said housing through which said tape passes during lineal movement of the tape, tension exerting means acting on said tape applying a selected tension thereto counteracting the weight of the float and tape depending from the tape storage means, a digital counter in said housing driven by the tape at a position adjacent said guide means during lineal movement of the tape by means located at spaced intervals on said tape, driving of said counter by said tape being a positive drive with a controlled amount of slip corresponding to a predetermined relationship existing between the float movement and volume change providing a direct reading of changes in volumetric content of the storage tank throughout the entire extent of travel of the tape.

4,192,188

CATALYST SAMPLER DEVICE

Arthur C. Worley, Mt. Tabor, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 1, 1978, Ser. No. 901,440
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—424 5 Claims



1. An apparatus for retrieving particulate matter from one level of a fixed bed reactor containing particulate beds spaced apart in an elongated vessel, such apparatus comprising:

(a) an elongated inner tube slidably disposed within an outer tube which extends upwardly through said vessel and passes through said fixed beds of particulate matter, the top of said outer tube terminating in an empty space between said particulate beds to permit venting of said tubes through the top and also avoid thermal and bed weight distortion of said outer tube, said inner and outer tubes each having inlet and outlet means for transmitting particulate matter therethrough, said outer tube secured to said vessel and forming a pressure-tight connection therewith;

(b) a shaft of a handwheel having adjustable spaced stops which are specifically measured whereby when said handwheel has been rotated to one of said stops said inner tube inlet means is in communication with said outer tube inlet means and said inner tube outlet means is out of engagement with said outer tube outlet means, and whereby when said handwheel is rotated to another of said stops said outer tube outlet means is in communication with said inner tube outlet means and said inner tube inlet means is out of engagement with said outer tube inlet means; and

(c) means for collecting said particulate matter, said means being connected in pressure sealed engagement with said outer tube outlet means.

4,192,189

RATE SENSOR

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 2, 1978, Ser. No. 947,387
Int. Cl.[2] G01P *15/00*
U.S. Cl. 73—505 13 Claims

1. A rate sensor comprising:

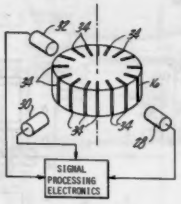
a nonmagnetic sensor housing having an internal cavity formed therein;

a sensor rotor having an axis of rotation disposed in said cavity and occupying less than the full volume of said cavity;

a volume of magnetic fluid filling the space in said cavity between said rate sensor rotor and said housing;

means for applying a magnetic field to said volume of magnetic fluid to levitate said sensor rotor in said cavity;

sensor means for generating signals corresponding to the angle of relative rotation between said sensor housing and said sensor rotor about the axis of said rate sensor rotor;



means responsive to said signals for generating a signal corresponding to the rate of angular rotation of said sensor housing;

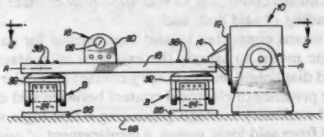
whereby the rate of angular movement of said sensor housing may be determined.

4,192,190

UNIDIRECTIONAL BEARING STRUCTURE HAVING TEMPERATURE CYCLING TOLERANCE

David V. Kimball, Claremont, Calif., assignor to Kimball Industries, Inc., Monrovia, Calif.

Filed Oct. 31, 1978, Ser. No. 956,184
Int. Cl.[2] G01M *7/00*
U.S. Cl. 73—665 23 Claims



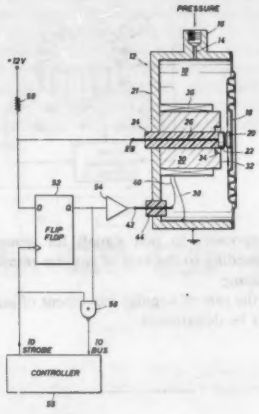
22. Hydrostatic bearing apparatus adapted to mount a shaker-coupled, dimensionally temperature dependent test piece for vibratory oscillation along a predetermined test axis, said apparatus comprising a support block having support walls and depending therefrom a displaceable compliant section defining a bore, said walls and section being locally laterally spaced opposite said bore to define a section displacement clearance, a shaft reciprocally axially journaled in said section bore in centrally supported relation and defining with said bore a bearing locus paraxial with said test axis, and bracket means securing said test piece to said shaft at opposite ends thereof beyond said support block section bore, said bracket means each comprising a saddle having depending ears defining split ring clamps circumferentially clamping said saddle to said shaft, and a base portion between said ears for rigidly fastening said bracket to said test piece, for bearing-guided test axis oscillation, said bearing locus being subject to shaft-transmitted sideways thrust upon temperature change induced dimensional changes in said test piece, said compliant section bearing locus being test axis paraxially bodily displaceable upon and to the extent of displacement of said compliant section into said clearance responsive to sideways thrusting of said shaft in test piece dimensional change accommodating relation.

4,192,191

PRESSURE SENSOR

Robert L. Nelson, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.

Filed Nov. 9, 1978, Ser. No. 959,314
Int. Cl.² G01L 7/00
U.S. Cl. 73—701 **12 Claims**



5. Apparatus for sensing a fluid pressure and producing a digital logic signal, the duty cycle of which is a measure of the pressure sensed, comprising

a chamber having an input opening through which the fluid pressure to be sensed is applied, said chamber having a flexible wall diaphragm including an electrical contact,

a coil having a stationary contact against which said diaphragm contact moves when said diaphragm is at rest and when said coil is energized, chamber pressure causing displacement of said contacts,

logic means connected to said stationary contact and to the winding of said coil, and

lock means connected to said logic means for causing said logic means to sample the existence of contact between said diaphragm and stationary contact at regular intervals, the presence of electrical contact between said diaphragm and stationary contacts producing a first logic signal output from said logic means, a displacement of said contacts resulting from internal chamber pressure producing a second logic signal output from said logic means for energizing said coil winding and causing closing of said contacts, the ratio of first logic signal output to total output resulting in a variable duty cycle measurement of sensed pressure.

4,192,192

DIAPHRAGM SEAL ASSEMBLY

Werner J. Schnell, Niles, Ill., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 2, 1978, Ser. No. 957,372
Int. Cl.² G01L 7/08
U.S. Cl. 73—715 **10 Claims**

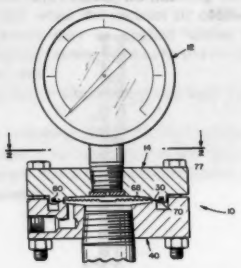
1. A diaphragm seal assembly for use with a fluid pressure responsive instrument including:

an upper housing member having a first inner side, said first inner side having a recessed surface defining a cavity and having a pasageway extending through said upper member for connection with said fluid pressure responsive instrument,

a lower housing member having a second inner side and a passageway extending through said lower housing member,

a diaphragm received in said cavity and clamped between said upper and lower housing member,

clamping means for securing said upper and lower housing members together, the improvement comprising;



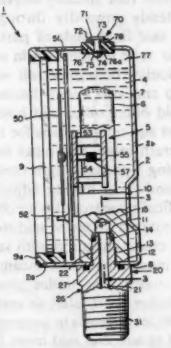
deformable lip means extending from said first inner side for bending over the periphery of said diaphragm to sealingly secure said diaphragm to said upper housing member, independent of the clamping means for securing the upper and lower members together.

4,192,193

LIQUID FILLED PRESSURE GAUGE

Werner J. Schnell, Niles, Ill., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 16, 1979, Ser. No. 12,681
Int. Cl.² G01L 7/04
U.S. Cl. 73—739 **12 Claims**



1. A pressure gauge comprising:

a case body having a cup-shaped housing with a first aperture therein, said housing including an outward protrusion with a flat wall zone surrounding the aperture, a support member having a first bore therein arranged within the case body, said support member including an end surface adapted to rest on said flat wall zone wherein said end surface has an outer contour adapted to the contour of said wall zone, an outer connection member having a second bore there through includes a first section extending through said aperture and sealingly received within the first bore, said outer connection member sealingly engages said flat wall zone of said case body, a fluid pressure measuring spring tube having a free end and an end secured to said support member, said tube includes an inner space connected to the bore of the outer connection member through the bore in the support member, and means arranged within said case supported by the support member and operatively connected to the free end of said

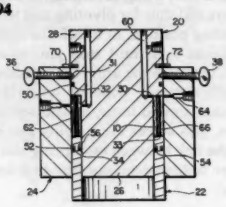
spring tube for indicating the measured fluid pressure acting in the tube.

4,192,194

METHOD AND MEANS FOR BIAXIALLY TESTING MATERIAL

Neil L. Holt, Foster City, Calif., assignor to Anamet Laboratories, Inc., San Carlos, Calif.

Filed Aug. 11, 1978, Ser. No. 932,951
Int. Cl.[2] G01N *3/10*
U.S. Cl. 73—794 **15 Claims**



1. Biaxial test apparatus for cylindrical material samples comprising

a first platen having an outer surface, an inner cylindrical surface, and a sample receiving surface at one end of said first platen,

a second platen having a cylindrical first portion for insertion into said first platen, a second portion, and a sample receiving surface on said second portion extending outwardly from said first portion, and

means for applying pressure to a cylindrical surface of a sample when mounted between said first platen and said second platen.

10. The method of biaxially stress testing a test sample having internal and external cylindrical surfaces comprising the steps of

(a) providing a lubricant at each end of said sample to compensate for surface irregularities and equalize loading of said sample ends,

(b) loading said sample and said lubricants between first and second platens,

(c) applying axial stress to said sample through said first and second platens, and,

(d) concurrently applying pressure to a cylindrical surface of said sample.

4,192,195

STARTER WITH A SHOCK ABSORBING ARRANGEMENT

Sadayosi Kazino, and Tatsuo Doi, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

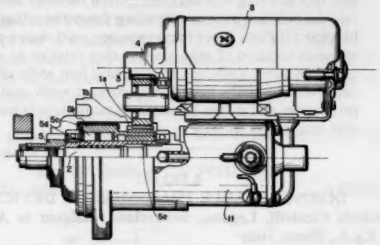
Continuation-in-part of Ser. No. 746,745, Dec. 2, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,319
Claims priority, application Japan, Dec. 3, 1975, 50/163765[U]
Int. Cl.[2] F02N *11/00*; F16D *7/02*
U.S. Cl. 74—7 A **6 Claims**

1. A starter for a vehicle comprising:

an electric motor having an armature shaft,

a speed reduction gear mechanism having a drive gear connected to said armature shaft and a driven gear associated with said drive gear and having a bore, said driven gear being the largest in diameter in said speed reduction gear mechanism,

a one way clutch having an axially extending cylindrical member the outer periphery of which is shrink-fitted to



the bore of said driven gear through a thin coating of solid lubricating material, and

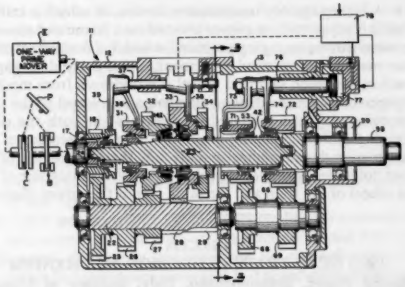
a pinion connected to said one way clutch.

4,192,196

BLOCKED CHANGE GEAR TRANSMISSION AND IMPROVED BLOCKER AND JAW CLUTCH ASSEMBLY THEREFOR

Edward J. Bogema, Vickburg; John R. Vandervoort, Richland, both of Mich., and John R. Bevins, Bluefield, W. Va., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1978, Ser. No. 929,377
Int. Cl.[2] F16H *3/38*; F16D *11/00*
U.S. Cl. 74—339 **28 Claims**



1. An improved blocker and jaw clutch assembly of the type comprising a substantially non-deformable blocker ring carried by a first of two axially engageable positive clutch members for rotation therewith with a predetermined relative rotation therebetween, said blocker ring axially movable relative to said first clutch member in at least one axial direction, said blocker ring operable to tend to rotate with said second clutch member at initiation of a clutch engaging operation, said blocker ring and first clutch member each having first projections extending therefrom defining a first array of interacting projections, said first array of interacting projections effective to block relative axial movement of said first clutch member toward said second clutch member if not aligned, said blocker ring having at least one rotational position relative to said first clutch member wherein said first array of projections are aligned and at least one rotational position relative to said first clutch member wherein said first array of projections are not aligned, said blocker ring effective to sense non-synchronous rotation of said clutch members corresponding to blocker ring rotation relative to said first clutch member sufficient to cause a non-alignment of said first array of projections to block axial engagement of said clutch members, the improvement comprising:

means associated with said blocker ring and said first clutch

member effective to automatically cause alignment of said first array of projections, said means comprising:

a pair of oppositely inclined ramps extending from one of said blocker ring and said first clutch member and at least one second projection extending from the other of said blocker ring and first clutch member, said ramps effective to cause rotation of said blocker ring relative to said first clutch member sufficient to align said first array of projections when axially biased into contact with said second projection, and means biasing said ramps into contact with said second projection.

4,192,197

DISENGAGEABLE TRANSMISSION DEVICE

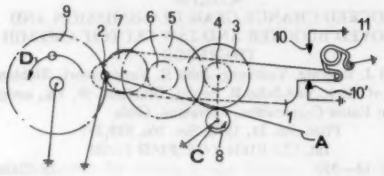
Rodolfo Cicatelli, Lugano, Switzerland, assignor to Autovox, S.p.A., Rome, Italy

Filed May 26, 1978, Ser. No. 910,055

Claims priority, application Italy, May 30, 1977, 49612 A/77

Int. Cl.² F16H *35/00*

U.S. Cl. 74—380 **13 Claims**



1. A disengageable transmission device, in which a train of wheels is supported on a lever pivoted on a frame and movable between a drive engaging position, in which a first wheel of the train meshes with a driving element, and a drive disengaging position, in which said first wheel is withdrawn from meshing engagement with the driving element, a last wheel of the train remaining engaged with a driven element in both the drive engaging and disengaging positions, the improvement of the transmission device comprising the fact, that the fulcrum of the lever coincides with the tangential point of the pitch line of the last wheel of the train and the pitch line of the driven element.

4,192,198

TWO GEAR TRAIN REDUCTION MECHANISM

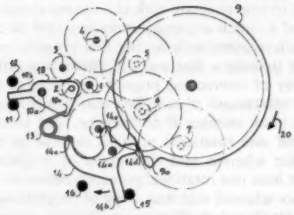
Edouard Jouret, Bresso-Milano, Italy, assignor to Crouzet, Paris, France

Filed Nov. 15, 1977, Ser. No. 851,625

Claims priority, application France, Nov. 25, 1976, 76 35634

Int. Cl.² F16H *35/00*

U.S. Cl. 74—384 **1 Claim**



1. A reduction mechanism comprising a first gear train having an input gear and an output gear, a second gear train having an input gear and the same output gear as said first gear train, said first and second gear trains being of different speed reductions, a cam engaged by said output gear, a motor, a driving pinion rotated by said motor, a first lever provided with an arm and pivotally mounted on a first axis, a step-up gear supported on said first lever and engaged by said driving pinion, a first fixed stop pin and a second fixed stop pin, a spring for suddenly pivoting said first lever from a first stable limiting position, in which said arm presses against said first stop pin and said step-up gear rotates the input gear of said first gear train, to a second stable limiting position, in which said arm presses against said second stop pin and said step-up gear rotates the input gear of said second gear train, a second lever provided with an arm and two followers and pivotally mounted on second axis, each of said two levers being linked to a respective end of said spring, a third fixed stop pin and a forth fixed stop pin, said cam being arranged for engaging either of said two followers and thus for pivoting said second lever from a first stable limiting position, in which the arm of said second lever presses against said third stop pin, to a second stable limiting position, in which the arm of said second lever presses against said fourth stop pin, whereby when the link between said spring and said second lever, as said second lever is pivoted by said cam, gets across the stability line extending from said first axis to the link between said spring and said first lever, said second lever suddenly pivots said first lever supporting said step-up gear.

4,192,199

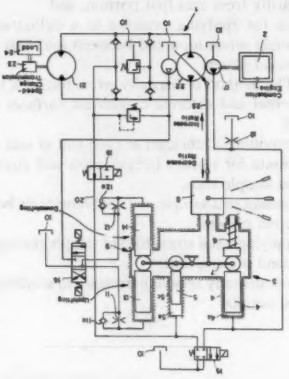
CONTROL SYSTEM FOR HYDROSTATIC TRANSMISSION

Karlmann Hamma, and Anton Ott, both of Tettnang, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,387

Int. Cl.² F16H *47/04*; F16D *31/02*

U.S. Cl. 74—687 **10 Claims**



1. A control system for regulating a hydrostatic transmission having an input hydraulic machine constituted as a pump having an input drivable at an input speed by a prime mover, an output hydraulic machine constituted as a motor having an output displaceable at an output speed and connectable through a speed-change transmission to a load, and a pressurizable hydraulic network interconnecting said machines and transferring force therebetween, one of said machines having a control element displaceable to vary the input-speed/output-speed transmission ratio, a said system comprising:

means including a pressurizable control cylinder for exerting on said control element in one direction a force related to said input speed;

means including a pressurizable regulating cylinder connected to said network for exerting on said control element in the opposite direction a force related to load; and

valve means connected to said cylinders for isolating said

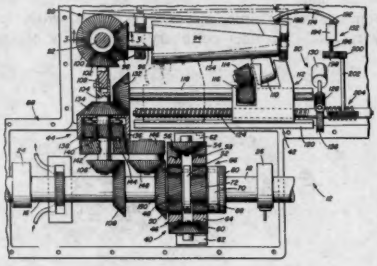
regulating cylinder from said network and depressurizing both of said cylinders during speed change of said transmission.

4,192,200

VARIABLE RATIO GEAR TRANSMISSION

Dan K. McCoin, El Paso, Tex., assignor to Bales-McCoin Research, Inc., El Paso, Tex.

Filed Aug. 20, 1976, Ser. No. 716,341
Int. Cl.[2] F16N *15/16*
U.S. Cl. 74—690 10 Claims



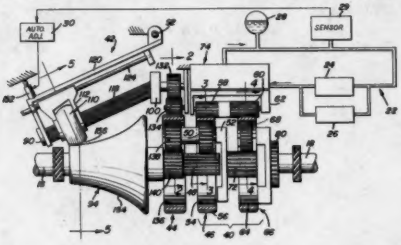
9. In a variable speed transmission having an input element and a driven element, a pair of conical traction members having drive engaging surfaces of generally equal pitch, gear means drivingly connecting one of the members to the input element,, means drivingly connecting the other of the members to the driven element, means connected to said other of the members for movement thereof relative to said one of the members to vary the drive ratio between the input and driven elements, means mounting said one of the traction members for pivotal displacement about a pivotal axis in response to movement of said other of the traction members, said input element being rotatable about a drive axis intersecting said pivotal axis, and adjustable coupling means connecting the input element to the gear means for adjusting the position of the pivotal axis.

4,192,201

TRACTION CONTROLLED IN-LINE TRANSMISSION

Dan K. McCoin, El Paso, Tex., assignor to Bales-McCoin Research, Inc., El Paso, Tex.

Continuation-in-part of Ser. No. 716,341, Aug. 20, 1976. This application Apr. 14, 1977, Ser. No. 787,372
Int. Cl.[2] F16H *37/06*
U.S. Cl. 74—690 10 Claims



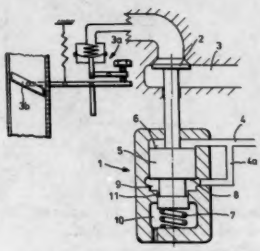
1. A change speed transmission comprising input and output members, power transmitting gear means directly interconnecting said input and output members for transmission of power in a relatively high torque range, traction drive means driven by the input member for selecting a variable drive ratio between said input and output members, and torque biasing means interconnected between the traction drive means and the power transmitting gear means for limiting transmission through the traction drive means to a relatively low torque range to establish said variable drive ratio.

4,192,202

APPARATUS FOR CONTROLLING THE CLOSING LIMIT OF A CARBURETOR THROTTLE VALVE

Reinhard Gospodar, and Paulus Heidemeyer, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,568
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649473
Int. Cl.[2] B60K *41/18;* F02D *11/08*
U.S. Cl. 74—859 5 Claims



1. In a motor vehicle having an internal combustion engine and an automatic transmission, said engine including an intake manifold and a carburetor with a throttle valve for supplying a fuel-air intake mixture to said intake manifold, said transmission including hydraulic control means for shifting said transmission and having at least one governor producing a first, speed-dependent hydraulic fluid pressure, apparatus for controlling the closing limit of said carburetor throttle valve comprising:

(a) vacuum pressure actuated means for varying the closing limit of said throttle valve in dependence upon a second vacuum pressure applied thereto;

(b) a vacuum line connecting said vacuum actuated means with a source of said second vacuum pressure downstream of said throttle valve;

(c) valve means arranged in said vacuum line for controlling said second vacuum pressure transmitted by said line; and

(d) means, coupled to said governor, for controll-said valve means in dependence upon said first speed-dependent fluid pressure said means including a control element movable by said first fluid pressure against a spring.

4,192,203

VARIABLE GEAR RATIO TRANSMISSION

Alvin Dailey, 4527 New Hampshire Ave., NW., Washington, D.C. 20011

Filed Feb. 1, 1978, Ser. No. 874,243
Int. Cl.[2] B60K *41/18;* F16H *5/06, 3/74*
U.S. Cl. 74—863 11 Claims

1. A constant meshed, variable gear ratio transmission comprising:

a gear box including;

a housing,

input and output shafts journaled in said housing;

a plurality of planetary gear sets in said housing coupling said shafts together and including,

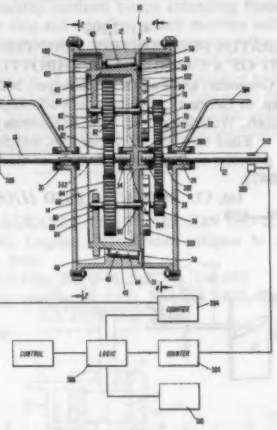
a pinion gear on each of said shafts;

a plurality of planetary gears meshing with each said pinion gear;

planetary gear shafts fixed to the corresponding planetary gears of each pinion;

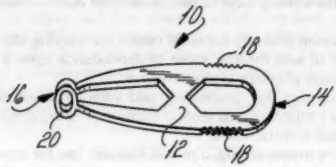
a cage rotatably supported in said housing and rotatably supporting said planetary gear shafts;

first hydraulic circuit means for controlling the rotation of said cage; and,



second independent hydraulic circuit means for controlling the rotation of said planetary gear shafts.

4,192,204
SOFT CONTACT LENS APPARATUS
Michael A. Feldman, 864 Glenridge Ave., North Woodmere, N.Y. 11581
Filed Aug. 3, 1978, Ser. No. 930,806
Int. Cl.[2] B25B *9/02*
U.S. Cl. 81—43 **11 Claims**



1. A soft contact lens apparatus comprising a clamp having a control portion, an intermediate portion, and clamp fingers, said intermediate portion comprising a fulcrum with said control portion being defined rearwardly of said fulcrum and said clamp fingers being defined forwardly of said fulcrum, said control portion opening said fingers when said control portion is squeezed together, said fingers being opened to no greater than substantially the diameter of a soft contact lens, said clamp fingers terminating forwardly in outwardly flared engaging resilient contoured surfaces with respect to a longitudinal axis of said apparatus, said flared contoured surfaces holding said contact lens, said surfaces moving together pinching said contact lens together as the control portion is released to remove the lens from the eye, said contoured surfaces holding said contact lens.

4,192,205
STUD EXTRACTOR
Michael Dorosh, Box 65, Boyle, Alberta, Canada
Filed May 18, 1978, Ser. No. 907,407
Claims priority, application Canada, Apr. 24, 1978, 301832
Int. Cl.[2] B25B *13/54*
U.S. Cl. 81—53.2 **2 Claims**

1. A torque transmitting device for insertion into a bore in a workpiece, comprising

a shaft formed with a plurality of slots spaced around the periphery of said shaft and extending parallel to the longitudinal axis of said shaft;

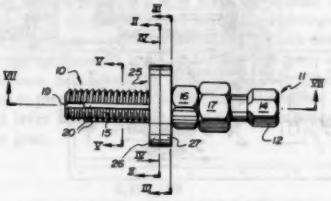
each of said slots having a bottom surface which is inclined towards the periphery of said shaft in a direction extending towards one end of said shaft;

a workpiece-engaging blade in each of said slots;

each of said workpiece-engaging blades being formed with an outer cutting edge for biting engagement with the wall of the bore and having, at its end remote from said one end of said shaft, a radially outwardly extending projection;

annular blade retaining means extending around said blades and said shaft;

said annular blade retaining means being formed with at least one recess in its inner periphery intermediate opposite



axial ends of its inner periphery for receiving and engaging said projections;

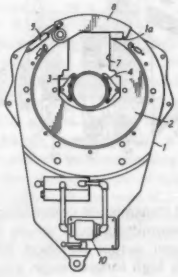
said annular blade retaining means comprising two separate annular portions and means for releasably securing said two annular portions together;

said two annular portions defining said recess therebetween; and

said annular blade retaining means being displaceable along said shaft; and

a nut in threaded engagement with said shaft at the side of said annular blade retaining means remote from said one end of said shaft for longitudinally displacing said annular blade retaining means and therewith said blades on rotation of said nut relative to said shaft.

4,192,206
APPARATUS FOR ROTATING A TUBULAR MEMBER
Jörg Schulze-Beckinghausen, Garbsen, Fed. Rep. of Germany, assignor to Weatherford Lamb, Inc., Houston, Tex.
Filed Jun. 6, 1978, Ser. No. 913,256
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726472
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.18 **8 Claims**



1. An apparatus for rotating a tubular member, comprising,

(a) a housing having a radially recessed opening for receiv-

ing the tubular member, said housing having a top member and a bottom member,

(b) a latch for closing off the radially recessed opening during operation of the apparatus, said latch being pivotally secured to the housing on one side of the radially recessed opening,

(c) a latch power means for actuating the latch connected to the latch,

(d) a guide disc mounted within the housing, said guide disc having a radially recessed opening for receiving the tubular member corresponding to the radially recessed opening of the housing,

(e) a plurality of gear rim rollers rotatably secured to the guide disc and to the housing,

(f) a gear rim mounted so as to be movable on the gear rim rollers, said gear rim having an interior wall and a radially recessed opening for receiving the tubular member corresponding to the radially recessed openings of the housing and of the guide disc,

(g) a gearing mechanism composed of a plurality of gears for transmitting power to the gear rim, said gearing mechanism being secured within the housing so as to intermesh with the gear rim,

(h) a power drive means for driving the gearing mechanism and the gear rim, said power drive means being secured to the exterior of the housing,

(i) a first and a second multifaceted cam mounted within the gear rim in axially staggered relation,

(j) a substantially crescent-shaped carrier member mounted within the gear rim, and having a first end and a second end, said carrier member being rotatable within the gear rim and along the cams,

(k) a first lever arm pivotally secured to the first end of the carrier member,

(l) a second lever arm pivotally secured to the second end of the carrier member,

(m) a first gripping jaw for gripping the tubular member, said jaw pivotally secured to the first lever arm,

(n) a second gripping jaw for gripping the tubular member, said jaw pivotally secured to the second lever arm,

(o) a first guide roller rotatably mounted to the first lever arm so that it moves on the faces of the first multi-faceted cam for actuating the first gripping jaw and mounted so that it cannot move on the faces of the second multi-faceted cam,

(p) and a second guide roller rotatably mounted to the second lever arm so that it moves on the faces of the second multi-faceted cam for actuating the second gripping jaw and mounted so that it cannot move on the faces of the first multi-faceted cam.

4,192,207

METHOD FOR FEEDING A PLURALITY OF WIRES

David E. Bickford, Harrisburg, Pa.; Robert K. Southard, Largo, Fla.; Matthew M. Sucheski, Harrisburg, and Earl W. Wagner, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 760,214, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 660,565, Feb. 23, 1976, abandoned. This application Apr. 18, 1978, Ser. No. 897,307

Int. Cl.² B26D *5/20*; B65H *17/22*

U.S. Cl. 83—42 **4 Claims**

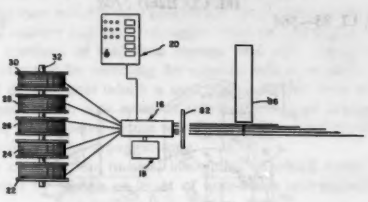
1. A method of incrementally feeding "n" wires of differential lengths from substantially endless sources of wire according to a program, said method comprising the steps of:

a. Guiding and locating each of said "n" wires in parallel on a feed roll with each wire disposed between said feed roll and one of "n" separate pressure rolls which are spaced from said feed roll in a non-feeding position,

b. calculating in a calculating means the increment for selected wires among said "n" wires as specified by said program,

c. moving in response to said calculating means selected pressure rolls among said "n" pressure rolls to a feeding position,

d. activating in response to said calculating means said feed roll to advance the increment as calculated in said calculating means,



e. repeating the steps of b, c, and d until said calculating means calculates a zero increment as specified by said program.

4,192,208

TRANSVERSE DIVIDING SHEAR FOR ROLLING-MILL PRODUCTS, ESPECIALLY HEAVY PLATE

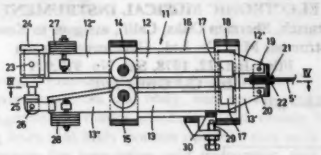
Erich Münker, Kreuztal; Alfred Klein, Hildenbach, and Gerhard Heitze, Netphen, all of Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,903

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728202

Int. Cl.² B26D *7/02*

U.S. Cl. 83—438 **10 Claims**



1. A transverse shear for rolled mill products comprising:

a support provided with a fixed lower blade and a movable upper blade for severing rolled plate between said blades and simultaneously applying a transverse force component to said plate in a direction of progress cutting across the plate;

a holddown clamp upstream of said blade and substantially adjacent same for retaining said plate against said lower blade;

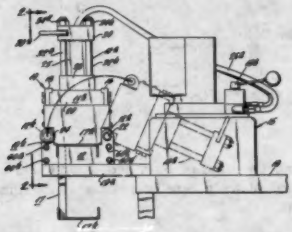
lateral-support elements disposed along and engaging the longitudinal edge of said plate at the side thereof toward which the cut progresses; and

at least one pair of clamping tongs downstream of said blades in the direction of advance of said plate between said blades adapted to grip the plate section downstream of the cut and retaining same in a predetermined orientation relative to said elements, thereby preventing the formation of a wedge-shaped cutting gap converging toward said side as a result of a first component in the plane of said plate section.

4,192,209
HYDRAULICALLY ACTUATED CUTTING AND PUNCHING ASSEMBLY

Edward F. Urbanski, Abington, Pa., assignor to P-W Industries, Inc., Cornwells Heights, Pa.

Filed Sep. 15, 1978, Ser. No. 942,614
Int. Cl.² B26D 5/08
U.S. Cl. 83—564 **5 Claims**



1. A hydraulically actuated assembly for cutting and punching channels comprising

a base section,

an upper hydraulically operated section pivotally secured to said base section having a first and a second member spaced from each other and defining the front and rear walls respectively of a cutting and punching chamber, said first and second members having upper recesses facing each other,

a mounting member forming an upper wall of said chamber and rigidly secured within said recesses of said first and second members to form a rigid support structure,

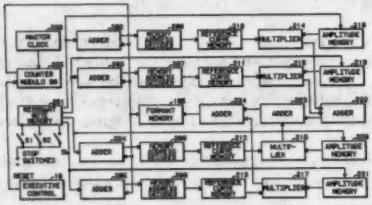
hydraulic cylinder means secured to said mounting member and extending into said chamber, and

cutting and punching means secured to said hydraulic cylinder means for providing said cutting and punching of said channel within said chamber.

4,192,210
FORMANT FILTER SYNTHESIZER FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Jun. 22, 1978, Ser. No. 917,921
Int. Cl.² G10H 1/02
U.S. Cl. 84—1.01 **6 Claims**



1. In a tone generator in which the relative amplitudes of a succession of points defining the waveform of an audio signal are generated digitally by adding the amplitudes for each of said points of a number of Fourier harmonic components of the waveform, the relative amplitudes of the points for each component being determined by multiplying a set of orthogonal function values by a harmonic coefficient value, and in which the relative amplitude values for each harmonic are scaled by a different scale factor from a stored list of scale factors corresponding to a fixed formant filter characteristic, apparatus for generating said list of scale factors comprising: an addressable memory means storing a group of words corresponding to the relative amplitudes of points defining a resonance curve, addressing means including a counter and a source of data designating a group of notes corresponding in frequency to the center frequencies of resonant peaks of the fixed formant filter for addressing said addressable memory means, said addressing means including means for modifying the counter output by an amount determined by each of the group of notes from said source of data to generate a corresponding group of addresses for addressing said memory with each setting of the counter, means for adding the resulting group of words read out from said addressable memory means for each setting of the counter, and means storing the sum of each of said group of words to form said scale factor list, whereby said last-named storing means stores a set of words corresponding in number to the modulo of the counter, the value of the words corresponding to the relative amplitudes of points defining the composite of a group of resonance curves.

4,192,211
ELECTRONIC MUSICAL INSTRUMENT

Eiichi Yamaga; Akira Nakada; Takatoshi Okumura; Eiichiro Aoki; Akiyoshi Oya, and Yasuji Uchiyama, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 28, 1978, Ser. No. 929,007
Claims priority, application Japan, Aug. 5, 1977, 52-93992; Aug. 23, 1977, 52-100966
Int. Cl.² G10H 1/00, 5/00
U.S. Cl. 84—1.01 **6 Claims**

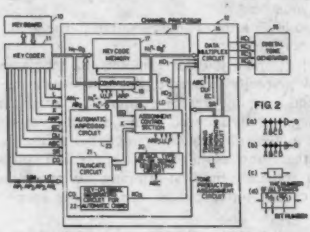


FIG. 2

1. A keyboard electronic musical instrument having a specified number of tone production channels connected by a number of output lines, comprising:

a tone production assignment circuit for assigning production of a tone selected by depression of a key to one of said channels and generating key information representing the note name of the assigned tone and key-on information representing depression or release of the key with respect to each channel to which tone production has been assigned, said key information and said key-on information for each channel together having a certain total number of bits;

data dividing means, connected to said assignment circuit and having parallel output lines of a number which is smaller than said certain total number of bits of the key information and the key-on information for each channel, for dividing the key information and the key-on information of the tone assigned to the particular channel into groups of data, each group having a number of bits matching the number of said output lines;

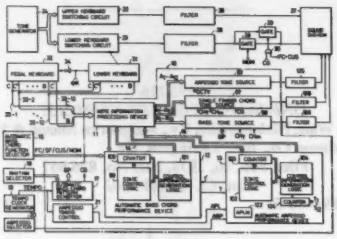
data multiplexing means, cooperatively connected to said data dividing means, for time division multiplexing said groups of divided data by delivering each group of data on said output lines in parallel data format, said groups being delivered sequentially in time division multiplexed order; and

a tone generator for generating the tone assigned to each channel in accordance with the multiplexed data.

4,192,212
ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC PERFORMANCE DEVICE

Eiichi Yamaga; Eiichiro Aoki, and Akio Imamura, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 22, 1978, Ser. No. 880,184
Claims priority, application Japan, Feb. 24, 1977, 52-19507; Feb. 24, 1977, 52-20077; Feb. 25, 1977, 52-20079
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.03 **16 Claims**



1. An electronic musical instrument comprising:
keys;
note information generation means for generating upon depression of the keys a plurality of note information representative of notes to be sounded in relation to the key depression;
selection means for selecting a note information representative of a note to be sounded from among said plurality of information from the note information generation means in accordance with a predetermined priority order;
output means for storing and delivering out the note information selected by said selection means; and
a tone producing means for producing each tone designated by the note information delivered out from said output means,
said selection means operating repetitively to select successive notes to be sounded and including masking type priority selection logic interconnected to said output means for selecting from said plurality of information the note information which is next in said predetermined priority order with respect to the note information which was stored in and delivered out from said output means at the preceding repetitive operation of said selection means.

6. An electronic musical instrument comprising:
keys;
processing means for carrying out one or more processes selected from the group including chord detection, root tone detection and single-tone selection according to note information specified by depression of said keys, and in response to control information; and
control means for supplying to said processing means control information required for carrying out a plurality of automatic performances such as an automatic bass chord performance and an automatic arpeggio performance, in a time division manner, with respect to each function of said automatic performances,
processing for said plurality of automatic performances being thereby effected in a time division manner in said processing means.

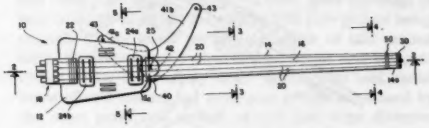
7. In an electronic musical instrument, an arpeggio production system comprising:
a data register having a separate storage position corresponding to each note name,
chord data entry means for entering into said data register subtone degree data indicative of the prime and intervals of a chord, the prime-indicative datum being entered in the storage position corresponding to the note name of the chord root,
an "arpeggio" register also having a separate storage position corresponding to each note name and storing a single signal in the storage position corresponding to the note name of the last produced arpeggio tone, and
masking type priority selection means, cooperating with said data register and said "arpeggio" register, for comparing the contents of said data register and said "arpeggio" register and for selecting the interval indicative datum in said data register which is next in preselected order with respect to the note name of said last produced arpeggio tone, said selected datum being usable to control production of the next arpeggio tone.

14. In an electronic musical instrument in which notes are represented by signals on a set of note-name corresponding lines,
a first priority selection circuit means, having a data input to which an input set of note-name corresponding lines is connected, having an output to which an output set of note-name corresponding lines is connected, and having a priority position control input to which a priority position defining control signal is applied, for gating to said output only those signals present on lines of said input set having an order in a specified relationship with respect to the priority position defined by said control signal, and
control means for providing to said control input a programmatically changing control signal which at different times defines different priority positions.

4,192,213
STRINGED MUSICAL INSTRUMENTS

Ned Steinberger, 444 12th St., Brooklyn, N.Y. 11215

Filed Sep. 18, 1978, Ser. No. 942,937
Int. Cl.[2] G10D *1/08;* G10G *5/00*
U.S. Cl. 84—293 **12 Claims**



1. A stringed musical instrument comprising a body, a neck portion extending from said body, said neck including a nut and a fingerboard, tuning machines, said tuning machines extending from said body portion opposite said neck portion, support means for supporting said instrument, said support means pivotally engaging said instrument, said support means pivoting at the center of gravity of said instrument, and said neck of said instrument weighing approximately no less than 2.5 pounds, said neck having an average cross section without a fingerboard of approximately 1.25 inches, and said neck deflecting no more than 0.09 inches when said instrument is supported to its center of gravity and with a five-pound weight depending from said nut of said neck.

4,192,214
SUPPORT DEVICE FOR MUSICAL INSTRUMENTS

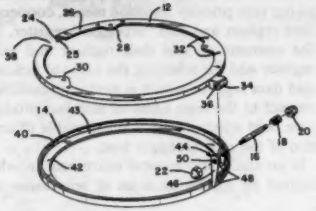
James L. Mixon, Jr., 5129 Irene Dr., Harrisburg, Pa. 17112, and Mark L. Sherman, 3613 Walnut St., Harrisburg, Pa. 17109

Filed Sep. 18, 1978, Ser. No. 943,240
Int. Cl.[2] G10G *5/00*
U.S. Cl. 84—327 **6 Claims**

1. A support device for stringed musical instruments comprising:
a. a first member adapted to be removably attached on an instrument at a distance spaced inwardly from the instruments' back side;

b. a second member adapted to fit against the instruments' back side; and

c. hinge means comprising a pin receiving housing on one member, a bracket on another member with side rails



extending to either side of the pin receiving housing, and a pin passing through the side rails and housing

so that the second member may be rotated away from the instrument to a position for supporting the instrument.

4,192,215

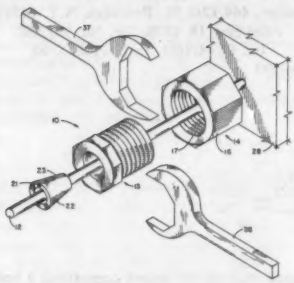
TENSIONING APPARATUS AND METHOD OF APPLYING TENSION TO A TENDON

Nelson J. Hymans, 5116 S. 81st St., Ralston, Nebr. 68127

Continuation of Ser. No. 577,691, May 5, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,377

Int. Cl.[2] E04C *3/26;* **E21B** *19/00;* **F16B** *17/00*

U.S. Cl. 85—36 **4 Claims**



1. A tensioning apparatus adapted for employment with two torque wrenches coacting with only a plane surface of a body to induce torsion-free axial tensile stress in a linear member which extends from the body generally perpendicularly to the plane surface, the apparatus comprising:

wedge gripper means having an opening formed axially therethrough for generally concentric mounting on the linear member, an inner surface for gripping engagement of the linear member, and a tapered outer surface;

a sleeve member having an opening formed axially therethrough for generally concentric mounting on said wedge gripper means, a tapered inner surface for mateable contact and interaction with wedge gripper means tapered outer surfaces, and an outer surface with screw threads formed on a reduced diameter portion thereof and a separate and distinct integrally formed enlarged wrench engageable surface formed on another portion thereof for positive mateable mechanical engagement by one of the two wrenches, the enlarged wrench engagable surface having an outer dimension greater than the maximum thread diameter; and

a nut having an opening formed axially therethrough from end to end thus providing an inner surface with the inner surface having screw threads formed thereon for threadable contact with said sleeve member's threaded surface, an integral, enlarged wrench engageable surface formed on the outer surface thereof for positive mateable mechanical engagement by the other of the two wrenches, and a plane surface formed on one end thereof for mateable contact with the plane surface of the body, wherein said enlarged wrench engageable surfaces on said sleeve member and said nut cooperate to limit the travel of the threaded portion of the nut on the threaded portion of the sleeve in one direction only.

4,192,216

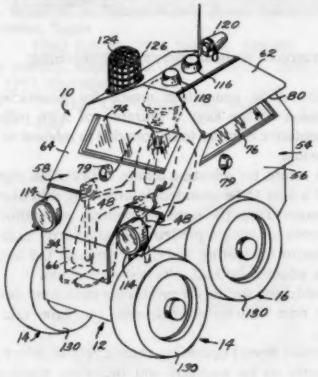
ONE-MAN ARMORED VEHICLE

Henry J. Wait, Nicholasville, Ky., assignor to Mason & Hanger-Silas Mason Co., Inc., Lexington, Ky.

Filed Feb. 10, 1978, Ser. No. 876,567

Int. Cl.[2] F41H *7/02*

U.S. Cl. 89—40 B **9 Claims**



1. A one-man armored vehicle comprising:

a self-propelled chassis having at least a pair of front and a pair of rear wheels provided with rubber-like bullet-resistant tires, an internal combustion engine for driving said wheels, transmission means between said engine and said wheels, and manually-operable means for selectively controlling the transmission and reversing of power from said engine to said wheels on the opposite sides of said vehicle;

an operator's seat on and adjacent the front portion of said chassis, said manually-operable means including a pair of hand levers one on each side of said seat;

armored housing means substantially enclosing said chassis, except for said wheels, and extending thereabove to define in part an operator's compartment, said housing means including an armored front access door provided with a transparent bullet-resistant window and a gun port therebelow, side and rear transparent bullet-resistant windows, and side gun ports below said side windows, said windows substantially providing 360° visibility for an operator and said gun ports being only large enough to accommodate the muzzle of a firearm to minimize the possibility of bullets entering said compartment;

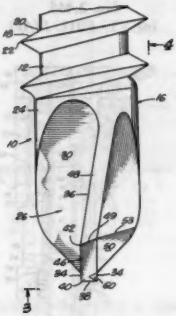
means defining an opening in the lower rear portion of said housing means for ingress of air to and egress of air and exhaust from said engine; and

armored louver means covering said opening and substantially obstructing line of sight therethrough.

4,192,217
SELF-DRILLING SCREW

Irwin J. Schwartzman, Northridge, Calif., assignor to J. Schwartzman Manufacturing & Supply Co., North Hollywood, Calif.

Filed Jul. 17, 1978, Ser. No. 925,345
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—41 4 Claims



1. In a self-drilling screw having an elongated threaded shank with a driving head at its outer end and a drilling portion at its inner end, the improvement in which:

(a) the drilling portion comprises a body having longitudinally extending flutes located substantially on opposite sides of said body;

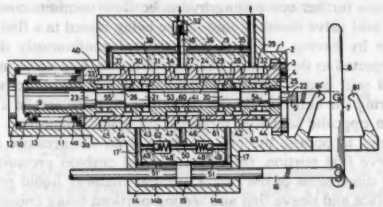
(b) a pair of back relief surface areas extending along and being further inclined with reference to the relief surfaces paralleling each of said tip-cutting edges and said side-cutting edges, said back relief surface areas having contiguous surface areas joined along a common edge extending rearwardly from the joined ends of the relief surfaces; and

(c) means forming salient cutting edges at the opposite ends of the cutting edge formed on said tip web, said salient cutting edges being conformed to provide a clawing cutting action in each case.

4,192,218
FAIL-SAFE FLUID CONTROL VALVE

Toru Yamamoto, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 722,757, Sep. 13, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,500
Claims priority, application Japan, Oct. 28, 1975, 50-129655
Int. Cl.[2] F01B *15/00*; F15B *9/10*
U.S. Cl. 91—216 A 5 Claims



1. A fail-safe fluid control valve comprising:

a housing formed with a hollow cavity therein, a first sleeve securely accommodated in said hollow cavity of said housing, a second sleeve slidably accommodated in said first sleeve, a valve spool slidably accommodated in said second sleeve, resilient means provided in said housing for resiliently retaining said second sleeve at a predetermined position and for resiliently returning said second sleeve to said predetermined position when said second sleeve is moved away from said predetermined position, a cylinder disposed in the vicinity of said hollow cavity of said housing and having a piston with a piston rod therein, an inlet conduit communicated with said hollow cavity and having a first check valve to permit oil under pressure to be admitted into said hollow cavity through said check valve, a bifurcated outlet conduit communicated with said hollow cavity to permit the oil to be discharged from said hollow cavity, a pair of cylinder conduits each connecting one side of said cylinder to said hollow cavity to permit the oil to be admitted into said cylinder from said hollow cavity and to be discharged from said cylinder to said hollow cavity whereby relative movement between said piston and piston rod and said cylinder will be effected, the improvement comprising:

said valve spool including first, second, third and fourth large diameter portions located at predetermined intervals along its axial length so as to define a first small diameter portion between said first and second large diameter portions, a second small diameter portion between said first and third large diameter portions, and a third small diameter portion between said second and fourth large diameter portions,

said second sleeve including a first port group located in opposing relation with said first small diameter portion of said valve spool and having at least one radial bore formed in said second sleeve, second and third port groups located in close proximity with each other and each having at least one radial bore formed in said second sleeve, the radially inner openings of said radial bores of said second and third port groups being closable by the outer peripheral surface of said first large diameter portion of said valve spool, fourth and fifth port groups located in close proximity with each other and each having at least one radial bore formed in said second sleeve, said fourth and fifth port groups being in spaced relation with said second and third port groups and the radially inner openings of said radial bores of said fourth and fifth port groups being closable by the outer peripheral surface of said second large diameter portion of said valve spool and being so closed when the radially inner openings of said radial bores of said second and third port groups are closed by the outer peripheral surface of said first large diameter portion of said valve spool, a sixth port group located in opposing relation with said second small diameter portion of said valve spool and having at least one radial bore formed in said second sleeve, a seventh port group located in opposing relation with said third small diameter portion of said valve spool and having at least one radial bore formed in said second sleeve, a first annular groove formed in the outer peripheral wall of said second sleeve to be in fluid communication with the radially outer opening of said radial bore of said first port group, a second annular groove formed in the outer peripheral wall of said second sleeve to be in fluid communication with the radially outer opening of said radial bore of said second port group, a third annular groove formed in the outer peripheral wall of said second sleeve to be in fluid communication with the radially outer opening of said radial bore of said third port group, a fourth annular groove formed in the outer peripheral wall of said second sleeve to be in fluid communication with the radially outer opening of said radial bore of said fourth port group, a fifth annular groove formed in the outer peripheral wall of said second sleeve to be in fluid communication with the radially outer opening of said radial bore of said fifth port group, a sixth annular groove formed in the outer peripheral wall of said second sleeve to be in fluid communication with the radially outer opening of said radial bore of said sixth port group, a seventh annular groove formed in the outer peripheral wall of said second sleeve to be in fluid commu-

nication with the radially outer opening of said radial bore of said seventh port group,

said first sleeve including an eighth port group having at least one radial bore formed in said first sleeve with its radially inner opening in fluid communication with said first annular groove, a ninth port group having at least one radial bore formed in said first sleeve with its radially inner opening in fluid communication with said second and third annular grooves upon said second sleeve being retained at the predetermined position by said resilient means, a tenth port group having at least one radial bore formed in said first sleeve with its radially inner opening in fluid communication with said fourth and fifth annular grooves upon said second sleeve being retained at the predetermined position by said resilient means, an eleventh port group having at least one radial bore formed in said first sleeve with its radially inner opening in fluid communication with said sixth annular groove, a twelfth port group having at least one radial bore formed in said first sleeve with its radially inner opening in fluid communication with said seventh annular groove, a thirteenth port group having at least one radial bore formed in said first sleeve with its radially inner opening closed by the outer peripheral wall of said second sleeve and said radial bore of said thirteenth port group having an inner side, said inner side being closely adjacent said eighth port group, said first annular groove having an inner face substantially radially aligned with said inner side upon the second sleeve being retained at the predetermined position by said resilient means, a fourteenth port group having at least one radial bore formed in said first sleeve with its radially inner opening closed by the outer peripheral wall of said second sleeve and said radial bore of said fourteenth port group having an inner side, said inner side of said radial bore of said fourteenth port group being closely adjacent to said eighth port group, said first annular groove having another inner face substantially radially aligned with said inner side of said radial bore of said fourteenth port group upon the second sleeve being retained at the predetermined position by said resilient means, an eighth annular groove formed in the outer peripheral wall of said first sleeve to be in fluid communication with the radially outer opening of said radial bore of said eighth port group, a ninth annular groove formed in the outer peripheral wall of said first sleeve to be in fluid communication with the radially outer openings of said radial bores of said ninth and thirteenth port groups and one of said cylindrical conduits, a tenth annular groove formed in the outer wall of said first sleeve to be in fluid communication with the radially outer openings of said radial bores of said tenth and fourteenth port groups and said remaining cylinder conduit, an eleventh annular groove formed in the outer peripheral wall of said first sleeve to be in fluid communication with the radially outer opening of said radial bore of said eleventh port group and said outlet conduit, and a twelfth annular groove formed in the outer peripheral wall of said first sleeve to be in fluid communication with the radially outer opening of said radial bore of said twelfth port group and said outlet conduit,

a by-pass conduit connected with said cylinder conduits and accommodating therein a pair of second check valves, said by-pass conduit being in fluid communication at its longitudinal position between said check valves with said eighth annular groove of said first sleeve.

4,192,219

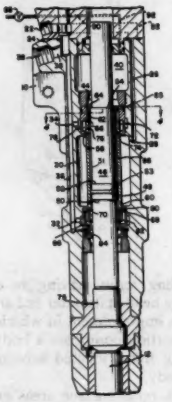
HYDRAULIC ACTUATOR

Eugene L. Krasnoff, Princeton, and Herman Lindeboom, Pennington, both of N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Division of Ser. No. 890,382, Mar. 27, 1978, Pat. No. 4,142,447, which is a continuation of Ser. No. 699,493, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 533,969, Dec. 18, 1974, abandoned. This application Jan. 10, 1979, Ser. No. 2,445

Int. Cl.[2] **F01L** *17/00*

U.S. Cl. 91—276 **3 Claims**



1. A hydraulic actuator comprising: a liquid source for supplying an operating pressure to a housing, the housing having a pressurized cushion chamber; a piston chamber formed by a slidable sleeve, a piston mounted within said housing and coxial with the slidable sleeve, said piston extending through the sleeve and into the pressurized cushion chamber, said piston having a first liquid pressure surface in the piston chamber and a second liquid pressure surface in the piston chamber, said piston also having a cushion chamber liquid pressure surface which alternately, continuously increases the pressure of the liquid in the cushion chamber during movement of the piston in one direction and continuously reduces the pressure of the liquid in the cushion chamber during movement of the piston in the other direction as the piston reciprocates; and piston reciprocating means comprising valve means including a valve member and said slidable sleeve, said slidable sleeve having axially spaced sets of ports, the ports supplying operating pressure to the piston chamber; the piston reciprocating means further comprising hydraulic flow conduits controlled by said valve member; said sleeve being biased in a first direction by having a first portion thereof continuously directly subjected to the cushion chamber pressure, said valve member and said hydraulic flow conduits being constructed so that during the entire cycle the operating pressure acts in a direction opposite said first direction on a second portion of the sleeve to oppose the bias resulting from the pressure on the sleeve first portion, the operating and cushion pressures and the dimensions of the piston cushion chamber liquid pressure surface and sleeve first and second portions being chosen such that said sleeve begins moving to a first position when the pressure in the cushion chamber relative to said operating pressure reaches a first predetermined level to permit the application of operating pressure to said first liquid pressure surface, said sleeve beginning to move to a second position when the pressure in the cushion chamber reaches a second predetermined level relative to said operating pressure to permit the application of operating pressure to said second piston liquid pressure surface.

4,192,220

VACUUM BOOSTER

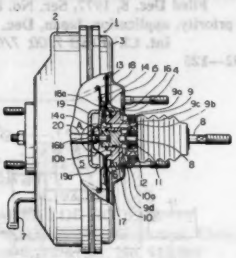
Kiyoshi Tateoka, Fujisawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Apr. 14, 1977, Ser. No. 787,457

Claims priority, application Japan, Apr. 20, 1976, 51-49614[U]

Int. Cl.[2] F15B 9/10; F01B 9/00

U.S. Cl. 91—376 R 1 Claim



1. A vacuum booster comprising a casing, a resilient diaphragm in said casing and having the outer periphery secured to the casing and dividing the interior thereof into two chambers, means connecting one of said chambers permanently to a source of vacuum, a power piston secured to said diaphragm, a valve mechanism incorporated in said power piston for selectively connecting the other chamber with said one chamber or a source of pressure higher than the vacuum pressure, an input rod connected to the valve mechanism for actuating the valve mechanism for generating differential pressure between said two chambers, an output rod member for receiving the force corresponding to the differential pressure from the power piston, said valve mechanism having a member on an end toward said output rod member, a pin-and-socket connection connecting the output rod member to said member of said valve mechanism, said pin-and-socket connection having a pin on one of said members and a socket on the other of said members snugly receiving the pin, said pin having an annular groove therein and a generally U-shaped resilient wire rod with two parallel arm portions engaged in said groove with an axial clearance sufficient for allowing free relative axial movement between the pin and socket corresponding to the dimension of said groove along said pin in a normal operating condition of the vacuum booster, said socket having two diametrically opposite grooves each extending along a chord of the socket and completely through the thickness of the wall of the socket in which the parallel arm portions are received for projecting into the annular groove in said pin, whereby said resilient wire rod prevents escape of said pin from said socket during assembly or repair of said vacuum booster.

4,192,221

RADIAL PISTON ENGINE

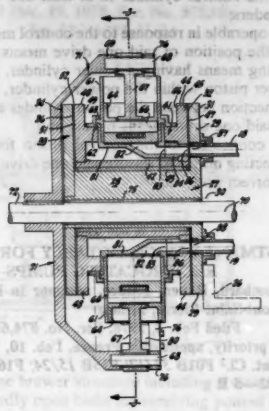
Thomas C. Robinson, 100 Hill Rd., Berkeley, Calif. 94708

Filed Dec. 29, 1978, Ser. No. 974,567

Int. Cl.[2] F01B 1/06

U.S. Cl. 91—487 18 Claims

1. An engine comprising a base, a spool mounted on said base and including a first hub symmetrical about a first axis and including a pair of side plates normal to and having inside faces spaced apart along said first axis, means defining plate ports in said inside faces, a cylinder rotor including a second hub rotatable on said first hub about said first axis and including a pair of side discs normal to and having outside faces spaced apart along said first axis between said side plates to establish first and second axial clearances each between one of said side plates and the adjacent side disc, cylinders mounted radially on said rotor, means establishing ducts in said cylinders extending to disc ports in said outside faces generally axially opposite said plate ports, a driven shaft eccentrically journalled with respect to said hub, a rotor fast on said driven shaft, pistons in said



cylinders, and means for operably connecting said pistons to said rotor.

4,192,222

POWER PISTON APPARATUS

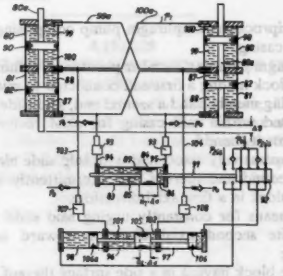
Herbert R. Dits, Schmelz, Fed. Rep. of Germany, assignor to Transform Verstarkungsmaschinen Aktiengesellschaft, Bous, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 815,015

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631479

Int. Cl.[2] F01B 25/04; F15B 11/22; F01B 7/00

U.S. Cl. 91—517 7 Claims



1. A power piston apparatus comprising, in combination:

a plurality of hydraulic piston drive means, each of the drive means having an enclosed cylinder and a double acting piston within the cylinder to divide the same into a pair of fluid spaces;

means for connecting the hydraulic piston drive means in operative relationship with each other, the connecting means including means for hydraulically connecting a fluid space of one of the enclosed cylinders to a fluid space of the other enclosed cylinder;

a plurality of metering means, one for each of the drive means, each of the metering means having an enclosed metering cylinder and a metering piston within the metering cylinder and connected to the corresponding drive means piston;

control means for detecting movement of at least one of the drive means pistons to an incorrect position, the control

means having a control cylinder, a control piston within the control cylinder, and means for hydraulically connecting the control cylinder to at least one of said enclosed cylinders;

means operable in response to the control means for correcting the position of said one drive means piston, the correcting means having a power cylinder, a double acting power piston within the power cylinder, and a hydraulic connection between the power cylinder and the cylinder for said one drive means piston; and

means connected to the control piston for operating the correcting means to restore said one drive means piston to its correct position.

4,192,223

ADJUSTMENT DEVICE, NOTABLY FOR METERING RECIPROCATING PUMPS

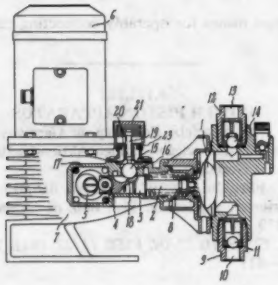
Didier Lombard, Rouen, France, assignor to Dosapro Milton Roy, Pont-Saint-Pierre, France

Filed Feb. 2, 1978, Ser. No. 874,683

Claims priority, application France, Feb. 10, 1977, 77 03749

Int. Cl.[2] F01B *31/12*; F15B *15/24*; F16J *1/10*

U.S. Cl. 92—5 R **11 Claims**



1. A reciprocating diaphragm pump comprising:

a pump casing;

a diaphragm pumping member positioned within said casing;

a slide block having a first end connected to said diaphragm pumping member and a second end, said slide block being mounted within said casing for axial reciprocal sliding movement therein;

means, operatively associated with said slide block adjacent said second end thereof, for intermittently moving said slide block in a first axial direction;

spring means for constantly urging said slide block in an opposite second axial direction toward said moving means;

said slide block having in a side surface thereof a groove at least partially defined by a surface which is inclined with respect to the direction of axial movement of said slide block;

a bore extending through said casing in a direction substantially transverse to said direction of axial movement of said slide block, said bore communicating with said groove in said slide block;

a ball supported within said bore and having a portion extending into said groove, such that said inclined surface of said groove abuts with said ball during movement of said slide block in said second axial direction, thereby limiting the extent of movement of said slide block in said second axial direction; and

adjustment means, axially adjustably extending into said bore in a direction transverse to said direction of axial movement of said slide block and having an inner end abutting said ball, for adjusting the extent of said portion of said ball which extends into said groove, for thereby adjusting the relative position of said ball with respect to said inclined surface, and for thereby adjusting the extent of movement of said slide block in said second axial direction.

4,192,224

ROTARY MASTER CYLINDER MEANS

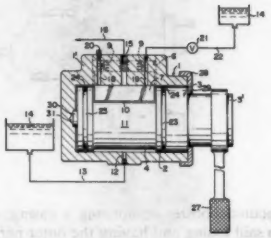
Hiromasa Okamura, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 8, 1977, Ser. No. 858,792

Claims priority, application Japan, Dec. 17, 1976, 51-152168

Int. Cl.[2] F15B *7/00, 7/08*

U.S. Cl. 92—125 **5 Claims**



1. A rotary master cylinder means having a non-linear pressure output in response to a linear input comprising a housing having a cylindrical bore, a rotary piston rotatably mounted in said cylindrical bore and having at least one peripheral recess, at least one dam means slidably supported by said housing and radially inserted into said recess so as to define a pressure chamber between the wall of the cylindrical bore, the dam means and the peripheral recess; port means incorporated in said housing to communicate with said pressure chamber, said recess having radial depth which varies at a regular rate of change in accordance with its angular position so that the rate of change of volume of said pressure chamber relative to rotation of said rotary piston varies in accordance with the rotational angle of said rotary piston.

4,192,225

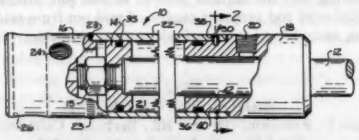
CYLINDER LOCKING RING

Laurence Moyer, Partridge, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Feb. 10, 1978, Ser. No. 876,777

Int. Cl.[2] F16J *11/02*

U.S. Cl. 92—169 **10 Claims**



1. A mechanical closure for the end of a linear hydraulic cylinder including a cylinder barrel having an open end with:

a closure member closing the open end of the cylinder barrel and defining a fluid tight chamber;

a pair of matching annular grooves concentrically spaced and longitudinally aligned with each other, one groove located in the cylinder barrel and the other in the closure member;

a radially extending slot extending from the exterior into the outer annular groove; and

a locking wire ring which is removably inserted in said pair of annular grooves through the slot, locking the closure member to the cylinder barrel; and locking means in the

cylinder for holding the inner end of the wire ring to the closure member;

in which the improvement comprises:

a pair of substantially prallel end walls on the radially extending slot; and

a u-shaped outer end on the locking wire ring, having sides parallel to each other and substantially normally spaced with respect to the circumference of the ring in side-by-side contact with the end walls of the slot so as to lock the closure member to the barrel against rotational movement.

4,192,226

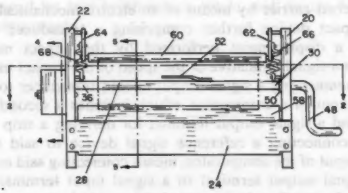
PAPER LOG ROLLER

Agostino Agostinelli, P.O. Box 244, Westbrook, Conn. 06498

Filed Jun. 2, 1978, Ser. No. 912,008

Int. Cl.² B31C *1/00*

U.S. Cl. 93—1 C **6 Claims**



1. An improved method forforming discontinuous flexible sheet into a roll with an apparatus wherein a first sheet has been partially formed into the roll about a shaft adapted to be rotated and wherein said sheet has a trailing edge, which comprises,

providing a cantilevered table in a position which contacts the roll and which supports the trailing edge of the first sheet; placing the leading edge of a second sheet on the trailing edge of the first sheet so that the leading edge intercepts the intersection of the first sheet and the circumferential surface of the roll being formed;

frictionally engaging the second sheet by rotation of the shaft;

tensioning and pressing on the first and second sheet formed about the shaft with the cantilevered table to tension and compact the roll; and

continuing to position second sheets upon the preceeding sheets in like manner until a roll of the desired size is accumulated.

4. Apparatus adapted to form discontinuous flexible sheets into a roll, said apparatus having a first end frame provided with a receptacle for receiving the first end of a shaft, rigidly interconnected with a second end frame having a receptacle for receiving the second end of a shaft, a shaft rotatably and removeably mounted between the first and second end frame, said shaft being adapted for receiving and engaging a sheet, and a means for rotating the shaft, the improvement comprising an elastically deflectable cantilevered table mounted between the end frames, the table having a free and unattached end adapted to press against the roll formed about the shaft and a fixed end adapted to receive and allow the passage of sheets toward the free end, the table further being adapted to support the trailing edges of a first sheet while the leading edge of a second sheet is placed thereon.

4,192,227

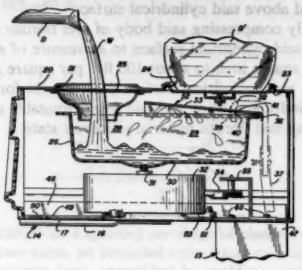
BEVERAGE BREWER

Stanton H. Petry, Arlington Heights, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed Dec. 19, 1978, Ser. No. 971,054

Int. Cl.² A47J *31/54*

U.S. Cl. 99—279 **22 Claims**



1. In a beverage brewer structure including a water heating device, an upwardly open basin for receiving poured brewing water, said basin being connected to the water heating device for delivering the poured water to the water heating device to be heated therein, a housing having an upper wall overlying a first portion of the basin and provided with a pour-in opening for passing poured water downwardly therethrough into the basin and a warmer station opening overlying a second portion of the basin, and a warmer station mounted to said upper wall to extend across said warmer station opening, the improvement comprising

wall means disposed subjacent said warmer station opening for preventing liquid which may inadvertently pass downwardly through said warmer station opening from falling into said basin, said wall means being warmed as an incident of operation of the beverage brewer structure whereby evaporation of at least a portion of said liquid may be effected.

4,192,228

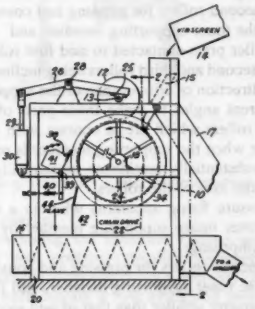
METHOD TO EXPRESS LIQUID FROM WET FIBROUS MATERIAL

Andrew V. Antoniuk; Lawrence V. Hankinson; David M. Boulter, and William R. McMillan, all of Edmonton, Canada, assignors to Celanese Canada Limited, Montreal, Canada

Division of Ser. No. 235,739, Mar. 17, 1972, abandoned. This application May 2, 1974, Ser. No. 466,349

Int. Cl.² B30B *9/20*

U.S. Cl. 100—37 **3 Claims**



1. In the acetylation of wood, a method to further reduce the acidity of the resulting product consisting of a body of wet

loosely bound cellulose acetate fibrous material without substantially breaking the fibers of the fibrous material and thereby minimizing loss of the fibrous material, comprising:

1. depositing said fibrous material containing acid over a smooth perforated cylindrical surface having from about 4 to 50% of the total area perforated;
2. rotating said cylindrical surface to bring said fibrous material into contact with a smaller freely rotatable roller mounted above said cylindrical surface;
3. gradually compressing said body of wet fibrous material against said cylindrical surface to a pressure of about 30 lbs. per square inch to about 100 lbs. per square inch, by rotating said cylindrical surface past the nip formed by said cylindrical surface and said freely rotatable roller;
4. removing said fibrous material in a drier state.

4,192,229

FIXING APPARATUS

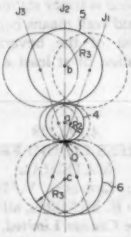
Haruo Tsunoi, Kawasaki; Teruo Morikawa, Sagamihara; Katsuhiko Yamada, Yokohama; Kenji Ohkawara, Koshigaya, and Atsushi Kubota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1978, Ser. No. 946,756

Claims priority, application Japan, Oct. 7, 1977, 52-120738; Dec. 5, 1977, 52-145932

Int. Cl.[2] B30B *3/04*

U.S. Cl. 100—158 R **20 Claims**



1. A pressure fixing apparatus wherein a toner image is fixed on a toner image supporting member by pressure, said apparatus comprising:

first and second rollers for pressing and conveying therebetween the toner supporting member; and

a third roller press-contacted to said first roller;

said first, second and third rollers being inclined with respect to the direction of conveyance of the supporting member at different angles to make those parts of said first and second rollers which are in contact with the supporting member when the supporting member is pressed therebetween substantially rectilinear substantially in the direction of the axes of the rollers.

12. A pressure fixing apparatus wherein a toner image is fixed on a toner image supporting member by pressure, said apparatus comprising:

first and second rollers for pressing and conveying therebetween the toner supporting member, said first roller having a diameter smaller than that of said second roller; and

a third roller press-contacted to said first roller and having a diameter which gradually reduces toward its longitudinal ends away from its middle portion.

4,192,230

PRINTER, PROVIDED WITH AN IMPACT DEVICE COMPRISING A TRANSDUCER

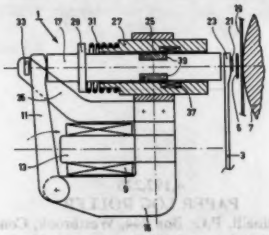
Nico Blom, and Jan T. Wor, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1978, Ser. No. 872,169

Claims priority, application Netherlands, Nov. 3, 1977, 7712160

Int. Cl.[2] B41J *7/92*

U.S. Cl. 101—93.03 **20 Claims**



1. A printer comprising an impact device including an impact member displaceable from a rest position in the direction of a record carrier by means of an electro-mechanical drive, the impact device further comprising a transducer which, during a displacement performed by the impact member, supplies a signal indicative of the speed of the impact member, means connecting a signal output of said transducer to a first signal input of a comparator which includes a second signal input and a signal output terminal for deriving a stop signal, means connecting a reference signal device to said second signal input of the comparator, means connecting said comparator signal output terminal to a signal input terminal of an electrical actuation device coupled to said electromechanical drive of the impact member, means responsive to a start signal for actuating said electromechanical drive via said actuation device, the actuation of the electromechanical drive being terminated only after the appearance of the stop signal at the signal output terminal of the comparator, and calculating means coupled to the transducer output for deriving a control signal determined by the speed and position of the impact member, and means coupling an output terminal of the calculating means to a control input of the actuation device so that said control signal controls the amplitude of an actuation current supplied to the electromechanical drive of the impact device.

4,192,231

WASHING APPARATUS FOR INK ROLLERS OF PRINTING MACHINE

Yoshito Kawakami, Koshigaya, Japan, assignor to Toppan Printing Co., Ltd. and Nikka Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 7, 1978, Ser. No. 922,663

Claims priority, application Japan, Jul. 9, 1977, 52-82166

Int. Cl.[2] B41F *35/04*; B41L *41/04*

U.S. Cl. 101—425 **10 Claims**

1. A washing apparatus for an inking arrangement which contains ink rollers and a vibrating roller, comprising:

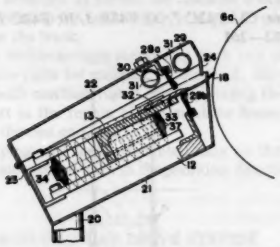
(a) a washing vessel having a tub and a cover; said cover being pivotally connected with said tub so that the cover may be opened, said washing vessel containing therein a doctor blade and brush means, said brush means being fixed to said washing vessel,

(b) means for supporting said washing vessel in parallel with an axis of said vibrating roller;

(c) means for moving said doctor blade toward and from a rolling surface of said vibrating roller; said means for moving the doctor blade reciprocating said doctor blade

within said washing vessel after said cover is closed such that said doctor blade is scraped by said brush means,

(d) means for opening said cover of the washing vessel when said doctor blade is advanced to the rotating surface of said vibrating roller and closing said cover when same is retracted within said washing vessel; and



(e) pipe means having a plurality of nozzles for spraying washing liquid principally to said brush means, whereby when said doctor blade contacts the rolling surface of the vibrating roller and then retracted within said washing vessel, said cover is closed and said doctor blade is scraped by said brush means while said doctor blade is reciprocated.

4,192,232

ELECTROSTATIC IMAGE RECORDING METHOD AND APPARATUS THEREFOR

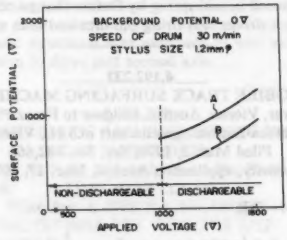
Hisashi Kato; Masakazu Iwasa, and Yoshio Kudo, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 14, 1978, Ser. No. 886,448

Claims priority, application Japan, Mar. 14, 1977, 52/27756; Mar. 14, 1977, 52/27757

Int. Cl.² B41M *1/42*

U.S. Cl. 101—426 **12 Claims**



1. An electrostatic latent image recording method in an electrostatic image recording apparatus in which an electrostatic latent image is formed on an electrostatic latent image recording surface by use of a plurality of recording styluses having a diameter of 0.3 mm to 3 mm wherein the improvement comprises a step of causing an over-discharge to occur between the recording styluses and said latent image recording surface while maintaining a spacing of 30μ to 150μ therebetween.

4,192,233

SHELL FOR SPORTING CARTRIDGE OF PLASTIC MATERIAL

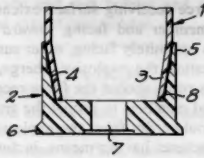
Thierry M. Dumortier, Liege, Belgium, assignor to Fabrique Nationale Herstal, en abrege FN, Herstal, Belgium

Filed Mar. 14, 1978, Ser. No. 886,474

Claims priority, application Belgium, Sep. 27, 1977, 56275

Int. Cl.² F42B *9/30*

U.S. Cl. 102—43 P **4 Claims**



1. In a shell for a sporting cartridge of plastic material comprising two parts, an extruded cylindrical case and a molded cap containing base, assembled by welding, said case being provided with a conical end, the base being provided with a corresponding conical seat for the purpose of recieving said conical end of the case, the conical surfaces being in contact with each other and made integral by an area of continuous welding, said welding being performed by rotating said case and said base with respect to each other, with sufficient velocity to ensure the welding of the surfaces in contact.

4,192,234

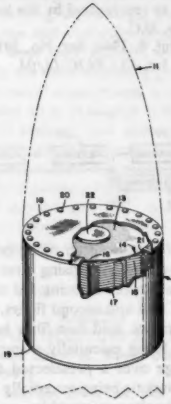
FRAGMENTATION EXPLOSIVE STRUCTURE HAVING ELONGATED FRAGMENTS

John McCracken, Dallas, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Apr. 16, 1975, Ser. No. 568,646

Int. Cl.² F42B *13/48*

U.S. Cl. 102—67 **17 Claims**



1. An explosive structure of the fragmentation type, comprising:

an explosive charge;

a housing containing the explosive charge and having a cylindrical wall portion extending peripherally of the explosive charge and comprising a plurality of articulated structures each having a first elongated member having first and second end portions and a second elongated member having first and second end portions, articulatory means interconnecting the respective first end portions of the first and second elongated members for permitting

rotation of the elongated members from a diverged configuration, in which their respective end portions are mutually spaced, to an aligned configuration, in which their respective second end portions are mutually adjacent and in which the first and second elongated members are substantially parallel, and means for separably constraining the articulated structures in their diverged configuration and in an array in which their first and second elongated members extend along planes substantially perpendicular to the housing axis, each elongated member having a respective force receiving surface extending longitudinally of the member and facing toward the explosive charge, and an oppositely facing, outer surface; and

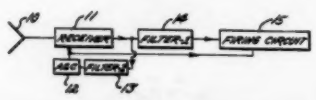
means for detonating the explosive charge, whereby the resultant forces react against the force receiving surfaces of the elongated members to propel the articulated structures radially outwardly from the explosive charge, the articulated structures having means, including the outer surfaces of the elongated members, responsive to adjacent airflow during any such outwardly propelled flight for rotating the elongated members of the respective articulated members into their aligned position for permitting axial flight of the articulated structures.

4,192,235

RADIANT-ENERGY CONTROLLED PROXIMITY FUZE

Omar J. Jacomini, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 8, 1964, Ser. No. 381,272
Int. Cl.[2] F42C *13/04*
U.S. Cl. 102—214 **1 Claim**



1. A receiver for the transmitter-receiver combination utilized with a proximity fuze comprising a receiver arranged to be gain controlled, said receiver being fed the radiant energy reflected by a target, first and second filters, each having predetermined characteristics, said first filter having a predetermined characteristic being essentially a smoothed value of a predetermined voltage over a preselected time, said second filter having a characteristic being essentially a smoothed value of said predetermined voltage over said preselected time minus a time seconds earlier, and each directly receiving the output signal from said receiver, an automatic gain control circuit interconnecting said second filter with said receiver, said automatic gain control operating so that the output signal from said first filter is the ratio between said value of said predetermined voltage over said preselected time, and said value of said predetermined voltage over said preselected time minus said time seconds earlier, and a firing circuit for said proximity fuze, said circuit being interconnected to said receiver by way of said first filter and also receiving an output signal from said automatic gain control circuit for addition to the output signal from said first filter.

4,192,236

FIRING MECHANISM FOR PERCUSSION CAPS

Andrew M. Scott, Wiltshire, England, assignor to Wallop Industries Limited, Stockbridge, England

Continuation-in-part of Ser. No. 773,116, Feb. 28, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,158
Claims priority, application United Kingdom, Mar. 4, 1976, 8791/76
Int. Cl.[2] F42C *7/00*; F42B *3/10*; F42C *15/06*
U.S. Cl. 102—261 **22 Claims**

1. A firing mechanism for firing a percussion cap, said mechanism comprising:

a percussion cap;

a percussion cap support having a position in which said percussion cap is located;

a leaf spring fixed at one end thereof to said support and extending across said percussion cap position;

a firing pin protruding from one side of said leaf spring towards said percussion cap;

a mass disposed on said leaf spring to back up said firing pin;

an engagement device engaged under said leaf spring, on the firing pin side of said leaf spring and at the end thereof opposite from said fixed end, for preventing access of said firing pin to said percussion cap when in the rest position prior to firing; and

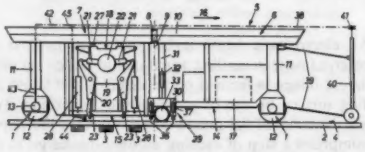
means for withdrawing said engagement device to fire said percussion cap, said withdrawal means being manually actuable to move said engagement device, thereby flexing said spring, to a certain position wherein said engaged end clears said engagement device and there is sufficient energy stored in said spring by flexure that on release of said spring it drives said firing pin into and fires said cap.

4,192,237

MOBILE TRACK SURFACING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 2, 1978, Ser. No. 882,666
Claims priority, application Austria, Mar. 17, 1977, 1862/77
Int. Cl.[2] E01B *27/17*
U.S. Cl. 104—7 B **11 Claims**



1. A track surfacing machine mounted on a track including two rails supported on a plurality of ties for mobility in a

working direction, which comprises a macine frame unit comprising

(a) two machine frame parts linked together to form the unit, each of the machine frame parts having two ends, respective ones of the machine frame part ends facing each other,

(b) coupling means linking the facing machine frame part ends and arranged to permit the machine frame parts to pivot in relation to each other in a plane substantially parallel to the track,

(c) a single undercarriage supporting each one of the machine frame parts for mobility on the track, the undercarriage of each machine frame part supporting the machine frame part in the region of the machine frame part end opposite the one end, and

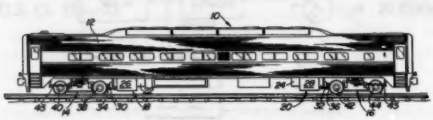
(d) the tamping tool means mounted only on the rear machine frame part, as seen in the working direction.

4,192,238

RAILWAY CAR DRIVE SYSTEM

James M. Herring, Jr., Merion Station, and Harry M. Russell-French, Ambler, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Jan. 3, 1978, Ser. No. 866,484
Int. Cl.² B61C 9/52; B61F 3/04, 5/06, 5/10
U.S. Cl. 105—133 **8 Claims**



1. A system for driving a rail car comprising:

(a) a truck for supporting the car body of said rail car,

(b) said truck including side frames with structural arm members extending inboard therefrom,

(c) first and second axles secured to said truck,

(d) first and second gear mechanisms mounted to said first and second axles, respectively,

(e) a speed control gear mechanism supported directly by said first axle and connected intermediate said first and second axles,

(f) driving means including a prime mover, torque converter and a transmission gear assembly connected to said car body,

(g) a shaft connecting said transmission gear assembly to said speed control gear mechanism,

(h) means for connecting said speed control gear mechanism to said first gear mechanism to drive said first axle, and

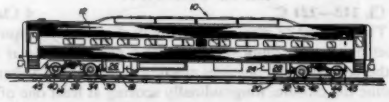
(i) a drive shaft extending from said speed control gear below said structural arm members to said second gear mechanism to drive said second axle.

4,192,239

SERIES PNEUMATIC AND COIL SPRING RAILWAY CAR SUSPENSION

John M. Paul, Holland, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jan. 3, 1978, Ser. No. 866,483
Int. Cl.² B61F 3/04, 5/06, 5/10, 5/52
U.S. Cl. 105—199 R **7 Claims**



1. A system for supporting a car body comprising:

(a) a truck assembly including a pair of longitudinally disposed parallel side frames,

(b) an elongated bolster disposed transversely and supported by said side frames,

(c) a pair of vertical mechanical springs disposed and spaced longitudinally with respect each side frame between said car body and said bolster towards each end of said bolster,

(d) a pneumatic spring serially connected to each pair of said vertical mechanical springs, and

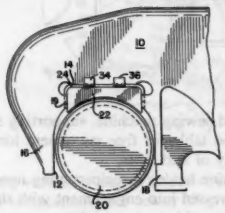
(e) shock absorber means connected horizontally between said car body and said bolster and disposed along the longitudinal axis of said bolster.

4,192,240

PEDESTAL ROOF WEAR LINER

Frank J. Korpics, Streamwood, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 12, 1978, Ser. No. 895,781
Int. Cl.² B61F 5/32, 5/38, 5/50, 15/20
U.S. Cl. 105—225 **4 Claims**



1. In a pedestal type side frame with an integrally formed downwardly open jaw which includes a roof and depending legs, said legs having substantially opposed stop lugs with recessed portion, a bearing assembly received in said jaw, a bearing adapter overlying said bearing assembly, and a wear liner disposed between said roof and said adapter; the improvement wherein said wear liner includes on each side laterally spaced substantially mutually opposing projections extending upwardly from the lateral edges of said wear liner, said projections being positioned so as to engage at least a portion of the lateral edges of said pedestal roof and thereby inhibit movement of said wear liner relative to said pedestal roof, said wear liner further including at least two substantially mutually opposing downwardly depending legs having tab portions which extend downward beyond said legs, said tab portions being positioned to engage cooperating recessed portions of said stop lugs to inhibit movement of said wear liner relative to said pedestal roof.

4,192,241

APPARATUS FOR QUILTING LAYERED FABRICS

Donald K. Reed, and Shere R. Reed, both of 1713 32nd St., Lubbock, Tex. 79411

Filed Sep. 15, 1978, Ser. No. 942,669
Int. Cl.² D05B 11/00
U.S. Cl. 112—117 **14 Claims**

1. An apparatus for quilting layered fabrics, comprising:

a table,

a winding shaft on said table extending for the length thereof,

a fabric shaft spaced from said winding shaft a distance at least as great as a section of the pattern to be quilted,

a liner shaft spaced from said fabric shaft and rotatably mounted on said table,

clamping means on said winding shaft for clamping at least the fabric and liner thereto,

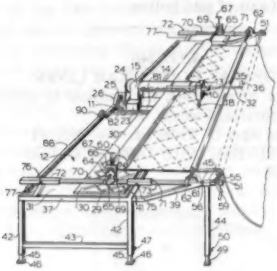
means rotatably supporting said winding shaft for rotation in

a winding direction, and selectively operable to hold said winding shaft from rotation in an unwinding direction,

means mounting said fabric and liner shafts for rotation and selectively operable to hold said shafts from rotation in a direction to release tension on the fabric and liner,

means for turning said fabric and liner shafts individually of each other for taking up tension on said fabric and liner and providing a taut section between said fabric shaft and winding shaft free from wrinkles,

a sewing machine,



a carriage for said sewing machine, supporting said sewing machine on said table for free movement longitudinally and transversely of said table,

said sewing machine having a reciprocating needle bar and pressure foot pressed into engagement with the fabric,

a motor for driving said sewing machine,

control means for said motor,

and means accommodating manual movement of said sewing machine longitudinally and transversely of said table to sew a selected pattern in said fabric and liner, comprising an extensible and retractable control arm accessible from one side of the table.

4,192,242

HOSIERY TOE CLOSERS

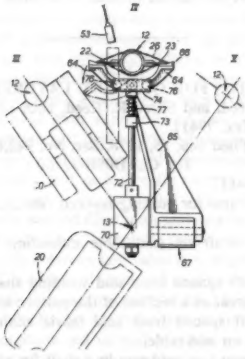
Bob Haselgrove, and John D. Nichol, both of High Wycombe, England, assignors to Detexomat Machinery Limited, United Kingdom

Filed Mar. 30, 1978, Ser. No. 891,689

Claims priority, application United Kingdom, Apr. 2, 1977, 14005/77

Int. Cl.[2] D05B *1/00, 97/00*

U.S. Cl. 112—262.2 **28 Claims**



1. An automatic method of setting a generally tubular garment to a predetermined position on a garment carrier comprising the steps of:

(a) drawing the garment onto the carrier;

(b) moving means into frictional engagement with the garment and moving said means and at least a portion of said garment towards said predetermined position;

(c) detecting an identifiable feature of said garment at said predetermined position and generating a control signal for said means upon detection;

(d) releasing said frictional engagement means from contact with said garment upon receipt of said control signal, whereby movement of said garment ceases.

4,192,243

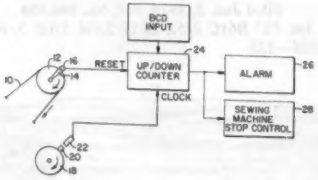
SEWING MACHINE THREAD MONITOR

Hubert Blessing, Dallas, and Gaylord D. Allison, Plano, both of Tex., assignors to Levi Strauss & Co., San Francisco, Calif.

Filed Oct. 2, 1978, Ser. No. 947,451

Int. Cl.[2] G06M *3/02;* **D05B** *69/36*

U.S. Cl. 112—273 **6 Claims**



1. Sewing machine apparatus for monitoring the number of sewing stitches made per measured length of thread consumed in making the stitches, the apparatus comprising

stitch sensor means connected to the sewing machine for generating a predetermined number of electrical pulses ("stitch pulses") for each stitch made by the sewing machine,

thread sensor means for measuring the consumption of thread and for generating a pulse ("thread length pulse") for each predetermined length of thread consumed,

a counter containing a preloaded count and having a reset input, a clock input, and an output, the clock input being connected to the stitch sensor means to receive the stitch pulses, the reset input being connected to the thread sensor means for receiving the thread length pulses and wherein the counter generates an output signal whenever the number of stitch pulses counted exceeds the preloaded count by a predetermined amount before the counter is reset to the preloaded count upon the receipt of a thread length pulse.

4,192,244

METHOD OF MAKING CAN CLOSURES

John S. Kelley, Wenham, Mass., and Richard P. Moldas, Weirton, W. Va., assignors to USM Corporation, Farmington, Conn.

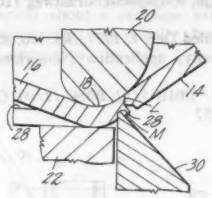
Filed May 23, 1978, Ser. No. 908,733

Int. Cl.[2] B21D *51/44*

U.S. Cl. 113—121 C **4 Claims**

1. The method of making a manually disruptable closure in a sheet metal can comprising forming a generally planar section thereof with wall portions meeting at the base of a channel to define the closure, longitudinally scoring at least one of the walls to provide a line of weakening therein, penetrating said one wall to provide a generally V-shaped line spaced radially inwardly of said weakening line to thereby form a defined strip

of swageable metal commensurate with the depth of said scoring and integral with said one wall, and then swaging said strip



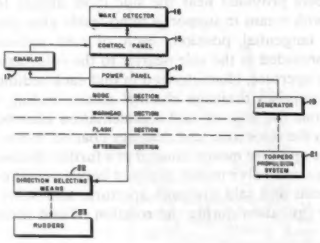
to cause its metal to flow into intimate sealing relation with the weakening line.

4,192,245

GUIDING MEANS FOR SELF-PROPELLED TORPEDOES

Paul M. Kendig; James M. Lawther, both of State College, Pa., and Robert G. James, Milwaukee, Wis., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1958, Ser. No. 735,915
Int. Cl.[2] F42B *19/01*
U.S. Cl. 114—23 **10 Claims**



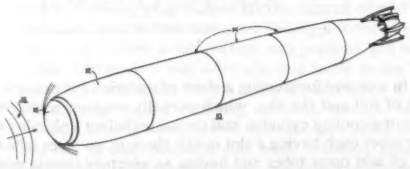
1. In a torpedo control system the combination comprising: a tuned transducer element for projecting compressional waves of a substantially fixed frequency and having an amplitude-modulated output signal; first means for receiving said amplitude-modulated output signal and having an output signal proportional to fluctuations of transducer impedance; and second means controlled by said first means for guiding the torpedo in a predetermined manner.

4,192,246

LAMINAR FLOW QUIET TORPEDO NOSE

Frank P. Hodges, Baltimore; Harold W. Fowler, Severna Park, and Phillip R. Anderson, Ellicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 3, 1978, Ser. No. 874,977
Int. Cl.[2] F42B *19/00*
U.S. Cl. 114—23 **4 Claims**



1. In a torpedo having a nose section and acoustic sensor means in said nose section, said torpedo having a boundary layer transition point which is a function of torpedo speed, shape and surface roughness, the improvement comprising:

(A) an acoustic window positioned in front of said sensor means;

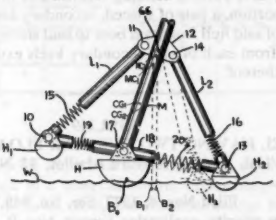
(B) said acoustic window having a skirt portion which surrounds and extends along said nose section to a location aft of said boundary layer transition point location at the minimum running speed of said torpedo.

4,192,247

SAILING VESSEL

John Riordan, 7855-Blvd. East, 11B, N. Bergen, N.J. 07047

Continuation-in-part of Ser. No. 807,670, Jun. 17, 1977, abandoned. This application Jul. 5, 1978, Ser. No. 921,984
Int. Cl.[2] B63B *35/00*
U.S. Cl. 114—39 **7 Claims**



1. A sailing vessel, having an effective center of gravity and an effective metacenter, said center of gravity and said metacenter being spaced from one another at a predetermined distance comprising:

a longitudinal center hull and two outrigger hulls flanking said center hull at opposite lateral sides of the same,

a mast mounted on said center hull;

a first pivot mounting a lower end of said mast to said center hull for pivotal movement about a first axis extending lengthwise of said center hull;

a first elongated member including a transverse brace mounted on said center hull for pivotal movement about said first axis;

second pivots mounting lateral ends of said transverse brace to said outrigger hulls respectively, for pivotal movement about respective second axes extending substantially parallel to said first axis; and

second elongated members, each including a rigid link having a lower end portion pivoted to a respective outrigger hull for movement about the respective second axis, and each having an upper end pivoted to said mast and upwardly spaced from said center hull for pivotal movement about a respective third pivot axis substantially parallel to said first and second axes, said upper ends being located at opposite sides of said mast.

4,192,248

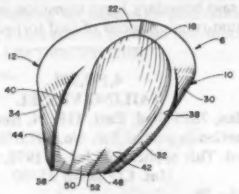
SCOOPED BOAT HULL HAVING TRI-KEEL SURFACES

Richard D. Moyer, 45 Ardmore Ave., Hermosa Beach, Calif. 90254

Filed Jan. 23, 1978, Ser. No. 871,533
Int. Cl.[2] B63B *1/06*
U.S. Cl. 114—56 **10 Claims**

1. A boat hull of relatively small draft, having low frictional drag characteristics for high speed, stable performance, said hull comprising a pair of spaced-apart side walls, and interconnected transom and bottom walls forming a bow and stern, said side and bottom walls defining an open-scoop portion and a primary keel portion, said open-scoop portion being of non-planar surface and of concave, curvilinear configuration commencing at said bow and extending rearwardly to a merging surface rearward of the mid-point of said hull, said open-scoop

portion being deepest at said bow and diminishing rearwardly in concave height to said merging surface and said primary keel portion, said primary keel portion being V-shaped in configuration and defining a primary keel extending from said merging surface to said stern, said open-scoop portion and said



primary keel portion defining rearward of the opening of said scoop portion, a pair of spaced, secondary keels extending the length of said hull from said bow to said stern; and chine means spaced from each of said secondary keels extending about the length thereof.

4,192,249

VESSEL HAVING TWO TUBULAR FLOAT ELEMENTS

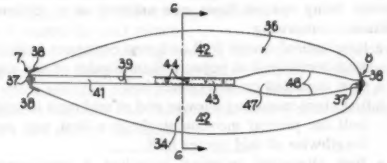
Henri Vidal, 8 bis, Boulevard Maillot, 92 Neuilly sur Seine, France

Filed Nov. 4, 1977, Ser. No. 848,768

Claims priority, application France, Nov. 9, 1976, 76 33707

Int. Cl.[2] B63B *1/12*

U.S. Cl. 114—61 **2 Claims**



1. A floating vessel comprising a rigid support structure which is elongate and has a prow and a stern and constitutes the means whereby the vessel floats, said support structure comprising means defining two rigid fluidtight hollow elongate tubular float parts which extend from the prow to the stern of the support structure and define an opening of the support structure, each of said float parts having relative to a vertical axial plane of the vessel an outer convex contour in plan, the outer contours of the two float parts in plan tapering toward and substantially meeting at the prow and stern of the support structure and thereby imparting to the support structure substantially a shape in plan of a conventional single-hull boat which tapers at both ends, the two float parts having in side elevation an upwardly concave curvilinear shape on an upper side and a downwardly convex curvilinear shape on a lower side of the float parts, first assembling means above the water line interconnecting the float parts at the prow and stern of the support structure and second assembling means intermediate and spaced from said first assembling means for rigidly interconnecting the two float parts, said opening extending throughout the height of the vessel between said first assembling means at said prow and stern and said second assembling means, and said opening having a width transversely of the vessel which is a minor part of the overall width of the support structure substantially throughout the length of the support structure, the tubular float parts each having a varying cross-sectional shape and widening in plan in the region of said second assembling means and a transversely substantially rectilinear upper contour whereby upper surfaces of the float parts substantially define a deck.

4,192,250

VALVE-CENTRIFUGE

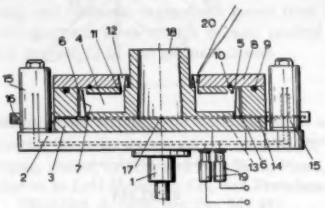
Pieter van Duijn, Rhijngeesterstraatweg 110, Oegstgeest, Netherlands

Filed Dec. 1, 1977, Ser. No. 856,406

Claims priority, application Netherlands, Dec. 9, 1976, 7613690

Int. Cl.[2] B04B *5/12*; B05C *11/08*; G01N *33/16*

U.S. Cl. 118—52 **5 Claims**



1. Centrifuge apparatus to sediment cells or similar particles from a suspension onto glass plates for cytological or cytochemical examination of such cells or particles, said apparatus comprising a rotor member for rotation about an axis having a plurality of radially extending sedimentation chambers, each of said chambers provided near the side most distant from the rotor axis with means to support a removeable glass plate in an essentially tangential position, each of said sedimentation chambers provided at the side nearest to the rotor axis with a fluid access aperture, characterized in that each sedimentation chamber comprises drainage channel means leading radially outward from the side of said sedimentation chamber most distant from the rotor axis, said drainage channel means including drainage aperture means situated at a further distance from the rotor axis and valve means disposed between said drainage channel means and said drainage aperture, said valve means adapted for operation during the rotation of said rotor member.

4,192,251

DEVICE FOR TREATING A SHEET OF MATERIAL PARTIALLY ENCLOSING A BACKING ROLL OR A COOLING CYLINDER

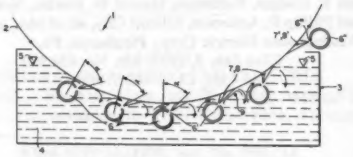
Fritz Gageur, Lindau-Bodolz, and Gerhard Trötscher, Lindau, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,985

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733335

Int. Cl.[2] B05C *3/12, 11/06*

U.S. Cl. 118—63 **4 Claims**



1. In a device for treating a sheet of material, for example a sheet of foil and the like, which partially encloses a backing roller or a cooling cylinder, said device including a plurality of outer tubes each having a slot nozzle thereon, an inner tube in each of said outer tubes and having an aperture therein positioned opposite the slot nozzle of the outer tube, said outer tubes being positioned at intervals with respect to each other and above and below a liquid level,

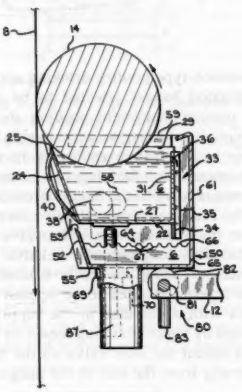
the improvement that said outer tubes have an eccentric interior, means supporting said inner tubes in an eccentrically pivotal manner, means whereby both of said tubes are jointly pivotal about a common axis, and means whereby the inner tubes are radially displaceable with respect to the outer tubes.

4,192,252

APPARATUS FOR APPLYING LIQUID TO CONTINUOUSLY ADVANCING FILAMENTS

Francis R. Paul, Aiken, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 23, 1979, Ser. No. 5,752
Int. Cl.² C03B *37/02*
U.S. Cl. 118—258 **5 Claims**



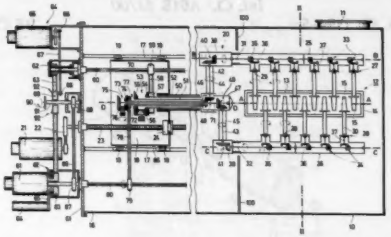
1. Apparatus for applying liquid to filaments comprising:
a rotatable surface adapted to supply said liquid to said filaments;
a first container adapted to supply said liquid to said applicator surface, said container comprising a bottom wall, a front wall having an upper edge extending along the length of said surface, a rear wall having a vertically oriented flow control means, the lower edge of said control means extending below said bottom wall, and the upper edge of said control means being lower than the upper edge of said front wall; and
a second container adapted to accommodate said first container to receive excess liquid on the exterior of said first container, said second container having a forwardly angled front portion, a rear portion, side portions, and baffle means intermediate said sidewalls, said baffle means having at least one recess therein to permit said liquid to pass therethrough while retaining sinkable foreign matter within a settling zone formed between said baffle means and one of said sidewalls and while retaining floatable foreign matter within said zone, said flow control means being positioned to direct excess liquid moving therethrough into said settling zone.

4,192,253

VACUUM COATING APPARATUS

Hans Aichert, Hanau am Main; Friedrich Stark, Langenselbold; Herbert Stephan, Bruchköbel, and Otto-Horst Hoffmann, Rodenbach, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 21, 1978, Ser. No. 962,835
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813180
Int. Cl.² C23C *13/08*
U.S. Cl. 118—712 **15 Claims**



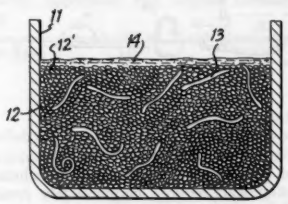
1. Vacuum coating apparatus for coating all sides of substrates by rotation in a material stream comprising vacuum chamber means with an elongated material source having a longitudinal axis and a transverse axis, substrate rack means with a plurality of fastening points for the planar arrangement of a plurality of substrates above the material source in a substantially uniform distribution over its surface, drive means associated with the substrate rack means for rotating the substrates, the substrate rack means having two parallel substrate bearer means disposed fork-wise, whose longitudinal axes B—B and C—C are disposed in mirror-image symmetry with a plane of symmetry passing through the longitudinal axis A—A of the material source, coupling means for the substrates being disposed on the confronting inner sides of the substrate bearer means, the axes of rotation of the couplings being aligned perpendicular to the plane of symmetry, the substrate bearer means being connected by angle drive means to the coupling means and to a motor means via drive shaft means.

4,192,254

FLOATABLE BEDDING

Richard L. Apel, 1924 Myrtlewood Dr., Ceres, Calif. 95307

Continuation of Ser. No. 758,931, Jan. 13, 1977, abandoned. This application May 2, 1978, Ser. No. 902,176
Int. Cl.² A01K *67/00*
U.S. Cl. 119—1 **5 Claims**



1. A life-cycle habitat for cultivating animal life such as worms and the like comprising a particulate material having a specific gravity of less than 1.0 and having a size and surface smoothness so as to inhibit the animal life such as worms and the like from burrowing into or clinging to said particulate material, and in admixture therewith, food matter for the support of said animal life whereby the animal life such as worms

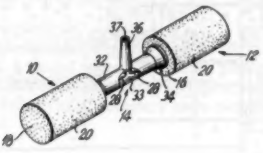
and the like being cultivated in said habitat can be readily separated from the components of said habitat by transferring the habitat containing said animal life to a container of water which will cause separation of said animal life from said particulate material.

4,192,255

AQUARIUM AIRSTONE DEVICE

Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.

Filed Sep. 7, 1978, Ser. No. 940,259
Int. Cl.[2] A01K *63/00*
U.S. Cl. 119—5 **15 Claims**



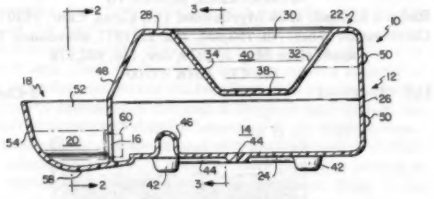
1. An aquarium device for use in an aquarium tank, said device comprising two airstones each having a nozzle extending therefrom, a connector having a tubular central portion for receiving said nozzles therein through respective outer ends thereof, and a tubular stem portion extending from said central portion for coupling to an air hose, said central and stem portions being connected to provide a T-shaped connector, whereby air entering said tubular stem portion is directed to both airstones.

4,192,256

COMBINED FEEDING AND WATERING DEVICE FOR PETS, HAVING INTEGRAL MEANS FOR CARRYING WATER

George D. Clugston, R.R. #3, Box 203, Pittsburg, Kans. 66762

Filed Oct. 30, 1978, Ser. No. 955,917
The portion of the term of this patent subsequent to Nov. 30, 1997, has been disclaimed.
Int. Cl.[2] A01K *5/01, 7/00*
U.S. Cl. 119—51.5 **5 Claims**



1. A pet dish, comprising:

structure having top, bottom and sidewalls defining a water-holding compartment, and a water-flow aperture through one of said sidewalls, said top wall including inwardly extending wall sections cooperatively presenting a recessed, foodreceiving cavity;

a cuplike, open-top, recessed member secured to the exterior of said apertured sidewall,

said water flow aperture and member being cooperatively located for communicating said compartment and the recess of said member such that water will flow from said compartment to said recess of said member; and

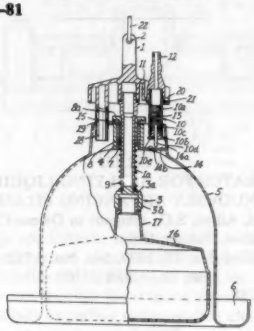
partition means located within said compartment proximal to said aperture and cooperable, with said wall sections, for dampening vibration-induced movement of water within the compartment.

4,192,257

SUSPENSION-TYPE POULTRY DRINKING APPARATUS

Santi T. Urzi, Johannesburg, South Africa, assignor to Custom Moulders (Proprietary) Limited, Johannesburg, South Africa

Filed Jan. 13, 1978, Ser. No. 869,127
Claims priority, application South Africa, Jan. 13, 1977, 77/0168
Int. Cl.[2] A01K *7/00*
U.S. Cl. 119—81 **13 Claims**



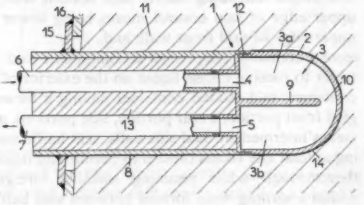
1. Suspension-type poultry drinking apparatus comprising a rigid, elongated hanger adapted to be suspended in freely swinging manner in upright position above ground level; a drinking vessel; mounting means movable longitudinally along the hanger and operative resiliently to mount the drinking vessel in suspension on the hanger to permit the vessel to move up and down relative to the hanger according to the weight of water in the vessel; and an inlet valve for controlling a supply of water to the drinking vessel, the valve including a closure member movable longitudinally relative to the hanger, the closure member being resiliently biassed towards a closed position and being adapted to be opened when the drinking vessel rises with a decrease in the supply of water therein, characterised by valve mounting means on the hanger which is adapted to mount the inlet valve on the hanger in a position off-set laterally from the axis of the hanger.

4,192,258

COOLING BOXES FOR BLAST-FURNACES

Francois M. J. Touze, Château de Logne, 57310 Guenange, France

Filed Apr. 18, 1978, Ser. No. 897,504
Claims priority, application France, Apr. 27, 1977, 77 12854
Int. Cl.[2] F22B *37/00*
U.S. Cl. 122—6.5 **12 Claims**



1. A water cooling box for a blast furnace comprising: a nose-shaped front element having walls which emborder a water cooling chamber, said front element being provided with

at least one water inlet and at least one water outlet, the walls of said front element being made from copper substantially; water delivery and discharge tubes; tube connecting means for connecting the said delivery and discharge tubes with the said at least one inlet and at least one outlet of the front element, respectively; a tubular body element surrounding said delivery and discharge tubes, said tubular body element being made from steel; and coupling means for sealing coupling of said front element and tubular body element with each other.

4,192,259

STEEL HEATING BOILER FOR LIQUID OR GASEOUS FUELS

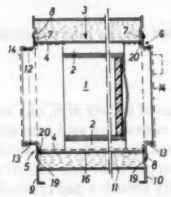
Hans Viessmann, Im Hain, 3559 Battenberg, Eder, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,505

Claims priority, application Fed. Rep. of Germany, May 14, 1978, 2721895

Int. Cl.[2] F22B *31/00*

U.S. Cl. 122—136 R **7 Claims**



1. A steel heating boiler for liquid or gaseous fuels, said boiler comprising a water-bearing housing including front and rear walls having openings surrounded by opening edges, a cylindrical installation unit including combustion chamber and fuel-gas flues being arranged in a liquid-tight way between said front and rear walls, the installation unit including a corrosion-resistant lining for said combustion chamber and fuel-gas flues, said unit further including end closure members covered at least in part by the lining, the end closure members having an outside diameter larger than the outside diameter of the installation unit and having outer peripheral edges connected in liquid-tight relation to the opening edges of the front and rear walls, the inside diameter of at least one said closure member being smaller than the inside diameter of the installation unit.

4,192,260

AIR PREHEATING MEANS AT A VERTICAL STEAM OR HOT WATER BOILER

Nils Östbo, Volrat Thamsgatan 4, Götenburg, Sweden (41278)

Continuation-in-part of Ser. No. 845,972, Oct. 27, 1977. This application Mar. 8, 1978, Ser. No. 884,563

Int. Cl.[2] F22B *7/12*

U.S. Cl. 122—182 R **3 Claims**

1. In a vertical boiler comprising a convection part and a final combustion chamber aligned therewith;

a cylindrical drum having upper and lower plane end walls;

a flame tube located centrally within said drum, and extending between the end plates thereof, said flame tube having burner means at its end at said upper end plate, and communicating with said final combustion chamber at its opposite end;

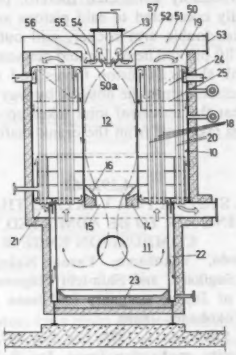
at least two groups of smoke tubes arranged concentrically, one outside the other, around said flame tube, extending between said end plates, an inward group of said at least two groups communicating at its lower end with said final combustion chamber;

a turning chamber located outside said upper end plate for communicating said at least two groups of smoke tubes and being outwardly defined by a wall parallel to and above said upper end plate;

a smoke gas outlet communicating with an outward group of said at least two groups of smoke tubes and the lower end thereof;

the improvement comprising an air chamber adjacent to and above said turning chamber, covering a substantial extent of the wall outwardly defining said chamber, and having at least one air inlet at its periphery, said air chamber comprising:

a tubular wall member forming an upwardly extending extension of said flame tube for defining a centrally location portion of said air chamber from said upper gas turning chamber, an end wall member extending inwardly



from said flame tube thereby defining said centrally located portion from said flame tube, and having an opening accomodating the head of said burner,

an annular baffle plate extending downwardly from said wall outwardly defining said air chamber, reaching almost to said last mentioned end wall member,

a guide plate attached to the lower end of said baffle plate in a substantially parallel relationship to said end wall member and directed outwardly from said baffle plate, and a collar projecting upwardly from said last mentioned end wall member around the opening therein accomodating said burner head and inside of said baffle plate.

4,192,261

MULTI-CYLINDER RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

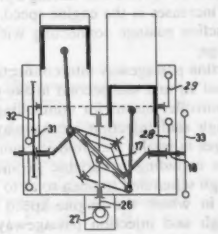
Josef Berg, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,319

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639260

Int. Cl.[2] F02B *75/26*

U.S. Cl. 123—58 B **13 Claims**



1. A multi-cylinder reciprocable piston internal combustion engine with the cylinders thereof arranged in series in a plural-

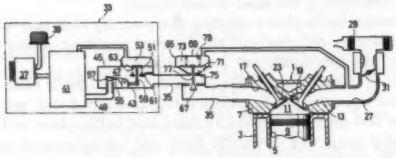
ity of rows, which comprises in combination: a housing having bearings, a crank shaft with Z-shaped lift pin journaled rigidly in said housing, a universal joint having adjustable trunnions journaled in said housing bearings, said universal joint comprising an outer part arranged within said housing and provided with journal pins, said universal joint also comprising an inner part journaled in said outer part by means of said journal pins, said inner part of said universal joint including a hollow shaft having its longitudinal axis extending perpendicular to the axes of said journal pins and being journaled on said Z-shaped lift pin, a double arm rocker journaled in the housing transverse to cylinder axes and having said outer part integrally non-rotatably connected thereto, pistons, connecting rods pivotally connected to said pistons and connecting the latter to said double arm rocker, said outer part extending around said lift pin and being located diametrically with regard to said crank shaft, all piston forces and mass forces being transmitted directly into the housing by way of the double arm rocker so that the universal joint takes up only the resulting torque forces taken off from the crank shaft.

4,192,262

CONTROL SYSTEM FOR VARYING THE AMOUNT OF SCAVENGING AIR TO BE ADMITTED TO INTERNAL COMBUSTION ENGINE

Michio Onoda, Yokohama; Yasuo Nakajima, Yokosuka; Kunihiko Sugihara, and Shin-ichi Nagumo, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 6, 1978, Ser. No. 867,599
Claims priority, application Japan, Jan. 8, 1977, 52-965
Int. Cl.[2] F02D *39/02*; F02M *7/00*
U.S. Cl. 123—75 B **5 Claims**



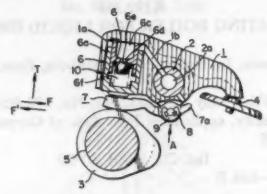
1. An engine system comprising:
an internal combustion engine having a combustion chamber, a first intake port passage opening to said combustion chamber, a second intake port passage opening to said combustion chamber, an exhaust port passage opening to said combustion chamber, a first intake valve closing said first intake port passage and adapted to open to perform an intake cycle, an exhaust valve closing said exhaust port passage and adapted to open to perform an exhaust cycle and a second intake valve closing said second intake port passage and adapted to open during a portion of said exhaust cycle and a portion of the subsequent intake cycle;
a source of compressed air having a pressure which increases with increases in the engine speed;
an induction passage connecting with said first intake port passage;
an injection passageway interconnecting said source of compressed air and said second intake port passage; and
flow controller means for controlling compressed air flow through said injection passageway in accordance with changes in intake manifold vacuum, said flow controller means including a variable geometry flow path therethrough scheduled to open so as to increase, under conditions in which the engine speed is constant, air flow through said injection passageway in accordance with increases in engine load in such a way as to increase the ratio of compressed air flow through said injection passageway with respect to intake air flow through said induction passage under light engine load.

4,192,263

VALVE DRIVE DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Katsutoshi Kitagawa, Seto, and Hiroki Yamauchi, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 26, 1977, Ser. No. 818,748
Claims priority, application Japan, Jul. 27, 1976, 51-89551
Int. Cl.[2] F01L *1/18*
U.S. Cl. 123—90.39 **1 Claim**



1. A valve device for an internal combustion engine comprising:
a cam;
a valve stem;
a pivotable mounted rocker arm, one end of said rocker arm having a part contacting said cam and the other end having a part contacting said valve stem;
an oil pressure tappet built into one of said contacting parts to automatically absorb a gap created between one of said contacting parts and said cam or said valve stem;
a movable plate inserted between said oil pressure tappet and one of said cam or said valve stem, being in contact with said oil pressure tappet;
a projection provided on said movable plate at a position opposed to the contacting part of said oil pressure tappet across the pivotal port thereof, which serves to prevent said oil pressure tappet from dropping out of said rocker arm before said rocker arm is set in an internal combustion engine, and hits said rocker arm when said movable plate revolves around said pivotal point, thereby regulating the revolving angle to a specified range;
a curve means formed at the contacting part between said oil pressure tappet and said movable plate; and
means for lubricating the contacting part between said oil pressure tappet and said movable plate.

4,192,264

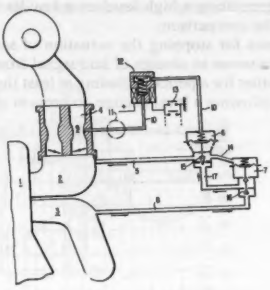
APPARATUS FOR THE RECIRCULATION OF THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Henry Arnaud, La Ferte Alais, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 30, 1978, Ser. No. 873,591
Claims priority, application France, Jan. 28, 1977, 77 02386
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**

1. An apparatus for recirculation of the exhaust gases of internal combustion engines including a carburetor, intake manifold and exhaust manifold, for antipollution control, which comprises:
a recirculation conduit interconnecting said exhaust manifold and said intake manifold;
a main valve disposed in said recirculation conduit including a moveable member and a resilient member for biasing said moveable member in a closed position;
a regulation valve connected to said recirculation conduit upstream of said main valve; and,
means for controlling the opening of said main valve as a function of air supply to said engine and means for controlling the operation of said regulation valve as a function of the pressure differential between pressure upstream and

downstream of said main valve moveable member such that supply of recycled gas from said exhaust manifold to



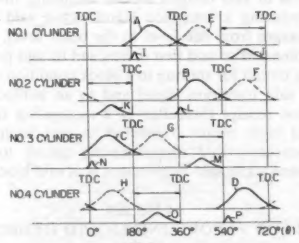
said intake manifold is accomplished as a function of engine load.

4,192,265

COMBUSTION PROMOTING DEVICE OF A MULTI-CYLINDER ENGINE

Masuo Amano, Okazaki, and Toshio Tanahashi, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 27, 1978, Ser. No. 900,595
Claims priority, application Japan, Dec. 2, 1977, 52-144679
Int. Cl.² F02B *33/00, 3/00;* F02D *39/02*
U.S. Cl. 123—119 A **8 Claims**



1. An internal combustion engine having a plurality of cylinders, each cylinder having an intake valve and an exhaust valve, said engine comprising:

an accumulation chamber.

a plurality of mixture feed branches, each branch interconnecting a respective cylinder with said accumulation chamber;

a plurality of auxiliary valves, each of which is located in a respective mixture feed branch, and;

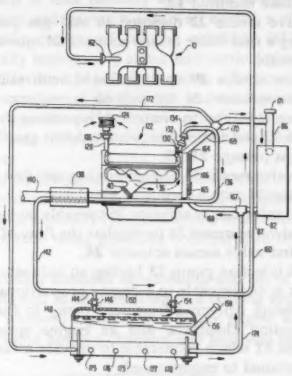
means for actuating said auxiliary valves to open at a time of the compression stroke and at a time of the exhaust stroke of the corresponding cylinder, wherein each auxiliary valve opens over almost the entire period of the compression stroke, and the opening duration of each auxiliary valve is longer during the compression stroke than during the exhaust stroke.

4,192,266

COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Charles E. Duckworth, 1421 SE. 10th St., Deerfield Beach, Fla. 33441

Filed Jun. 30, 1978, Ser. No. 920,925
Int. Cl.² F02M *31/00*
U.S. Cl. 123—119 A **6 Claims**



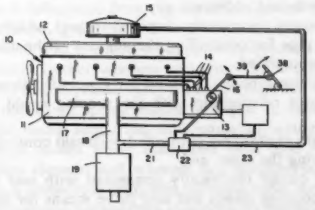
1. A cooling system for a multi-cylinder internal combustion engine having designated exhaust cylinders which burn the exhaust gases which are expelled from fuel burning cylinders, a separate intake manifold being provided for said exhaust burning cylinders, said engine having a liquid coolant pump for circulating liquid coolant through the engine block, said cooling system including a primary heat exchanger comprising a closed tank defining a reservoir for the liquid coolant, said tank being connected to supply liquid coolant to said liquid coolant pump and to receive liquid coolant from said engine block after circulation therethrough, and at least one set of coiled tubing positioned within said closed tank and immersed in liquid coolant contained therein, said coiled tubing having first and second ends, said first end communicating with ambient air, and said second end being connected to said separate intake manifold for said exhaust burning cylinders whereby the vacuum created in said separate intake manifold when said engine is running produces a suction, causing air to constantly flow through said coiled tubing, thereby cooling the liquid coolant within said closed tank.

4,192,267

EXHAUST GAS RECYCLING IN AN INTERNAL COMBUSTION ENGINE

John M. Cobb, Cold Spring, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,942
Int. Cl.² F07N *25/06*
U.S. Cl. 123—119 A **7 Claims**



1. In an internal combustion engine 10 of the fuel injection

type wherein a substantially constant volume of air is charged to the engine's respective combustion chambers from an air intake manifold **12**, and an amount of fuel is injected from a fuel injector pump **13** into said combustion chambers to form a combustible mixture, which, upon ignition, forms an exhaust gas which is introduced to an exhaust gas conduit **18**,

an exhaust gas recycle circuit having a gas passage **21**, **23** which communicates said exhaust gas conduit **18** with said air intake manifold **12**,

first valve means **22** disposed in said gas passage **21**, **23** having a first valve means actuator **24** operably engaged therewith,

a vacuum source **29** communicated with said first valve means actuator **24** to impose a vacuum atmosphere thereon whereby to controllably position the first valve means **22** and thereby regulate exhaust gas flow through said gas passage **21**, **23**,

second valve means **34** communicating said first valve means actuator **24** with a source of bleed gas,

a second valve means actuator **36** operably connected to said second valve means **34** to regulate the flow of bleed gas to said first valve means actuator **24**,

said fuel injection pump **13** having an indicator element **16** which is displaceable to a degree proportional to the fuel flow being delivered from said pump to the respective combustion chambers, and an engine speed indicator element **42** which is operable to provide a variable signal proportional to engine speed,

said fuel pump indicator element **16**, and said engine speed indicator **44**, being respectively communicated with said second valve actuator whereby to adjust the flow of gas bleed into said first valve actuator **24**.

4,192,268

AIR FLOW AMOUNT ADJUSTING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Aichi and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 798,948, May 20, 1977, abandoned. This application Apr. 17, 1979, Ser. No. 30,953

Claims priority, application Japan, May 28, 1976, 51-62542; May 31, 1976, 51-63325

Int. Cl.[2] **F02D** *1/04*

U.S. Cl. 123—119 EC **1 Claim**

1. In an additional air supply system for an internal combustion engine comprising:

a combustion chamber for producing combustion therein;

an intake system operatively communicated with said combustion chamber for supplying thereto an air-fuel mixture;

an exhaust system operatively communicated with said combustion chamber for conveying an exhaust gas from said combustion chamber to the atmosphere;

an additional air supply pipe communicated with at least one of said intake and exhaust systems for supplying additional air thereto, thereby controlling the air-fuel ratio of said air-fuel mixture at a desired value;

air-fuel ratio detecting means disposed in said exhaust system for detecting the air-fuel ratio of the air-fuel mixture supplied with said additional air;

control means operatively disposed in said additional air supply pipe for controlling the amount of the additional air to be supplied;

a timing pulse generating circuit for generating time pulses in a timed relationship with the running speed of said engine;

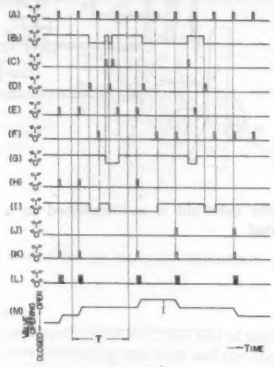
drive means operatively connected with said control means for driving the same; and

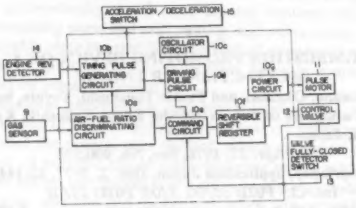
a control circuit electrically connected with said air-fuel ratio detecting means and said drive means for intermittently actuating said drive means in response to said timing pulses and the detected air-fuel ratio;

the improved control circuit comprising:

an air-fuel ratio discriminating circuit connected with said air-fuel ratio detecting means for comparing the output from said detecting means with a preset level and for generating a high level or a low level signal based on the comparison;

means for stopping the actuation of said drive means in response to change of said signal from one level to the other for a period including at least the first timing pulse following a level change, to prevent an erroneous operation of said control means, including first means for producing a transition signal when said level signal changes from one level to the other level, latch means connected to said first means and to said pulse generating circuit for shifting to a block condition upon receipt of said transition signal and to an unblock condition upon receipt thereafter of a succeeding timing pulse, and logic means connected to said latch means and connecting said discriminating circuit to said drive means while said latch means is in said block condition.





4,192,269

DEVICE FOR VAPORIZING LIQUID HYDROCARBON FUEL

Dudley D. Levy, 590 Laconia Cir., Lake Worth, Fla. 33463

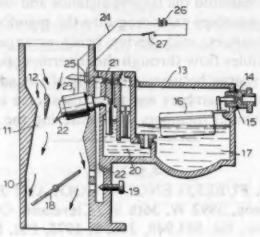
Continuation-in-part of Ser. No. 671,696, Mar. 29, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 890,706

Int. Cl.[2] **F02M** *31/00*

U.S. Cl. 123—122 F **2 Claims**

1. A device for vaporizing liquid hydrocarbon fuel as it enters a downwardly flowing stream of flowing oxygen-containing gas, comprising a reservoir for a vaporizable liquid hydrocarbon fuel, a liquid hydrocarbon fuel feed tube extending upwardly out of said reservoir and then laterally said tube has a lip means integrally formed on the end thereof and extending at an acute angle to the direction of the flow of the stream of gas past the end of said tube, means for conducting a stream of oxygen-containing gas downwardly past the end of said feed tube at less than atmospheric pressure for drawing fuel through said fuel feed tube, and an electric resistance heater operatively associated with the end of said feed tube and said lip means where it projects into the stream of gas and

having a heating capacity for heating the amount of liquid hydrocarbon fuel flowing through said fuel feed tube to a temperature which lies between a first temperature about halfway between the temperature of vaporization and the



temperature at which the vaporized hydrocarbon fuel becomes explosive in the oxygen-containing gas and a second temperature which is the temperature at which the vaporized hydrocarbon fuel becomes explosive in the oxygen-containing gas, whereby the fuel is instantaneously and completely vaporized as it flows out through said heated tube and over said heated lip means.

4,192,270

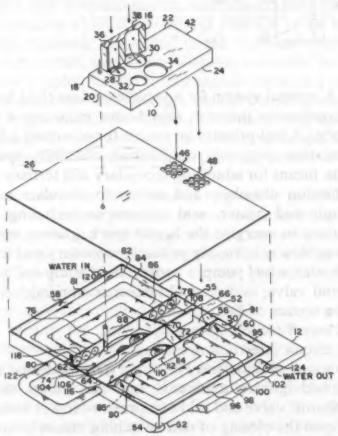
FUEL SYSTEM

Christopher P. Beckman, 996 Kelley Springs Rd., Harvest, Ala. 35749

Filed Jan. 8, 1979, Ser. No. 1,960

Int. Cl.[2] F02B *31/00*

U.S. Cl. 123—122 A **3 Claims**



1. A combination comprising:

an internal combustion engine having an intake manifold with a horizontally positioned surface having therein at least one inlet orifice (a) positioned to receive an air-gasoline mixture entering in a vertical direction;

a carburetor adapted to provide at at least one output orifice (b) an air-gasoline mixture;

a fuel vaporizer having an inlet orifice (c) adapted to mate with said outlet orifice (b) of said carburetor, and having an outlet orifice (d) adapted to mate with said inlet orifice (a) of said intake manifold, comprising:

an elongated, horizontal, generally closed intake chamber having in its top one end region said orifice (c) and in its bottom at an opposite end region an outlet orifice (e),

a first manifold chamber positioned below and connecting with said orifice (c) and having a side wall having at least one set of a plurality of vertically positioned tubular openings (f) arranged generally horizontally in a vertical plate (g) of said side wall, which plane is generally parallel to the longitudinal dimension of said elongated chamber, and

a second elongated manifold chamber adjacent to and generally at the same level as said first manifold chamber, and at least partially under said elongated intake chamber, and having a side wall having a plurality of vertically positioned tubular openings (h) arranged generally horizontally along said vertical plane (g) and in said last-named side wall and in a first end region of said second manifold chamber, and having in its bottom at an opposite end region an orifice (i) adapted to mate with said orifice (a) of said intake manifold of said engine;

at least one set of a plurality of tubes connected between said openings of said first and second manifold chambers, said set of tubes generally lying horizontal in a common plane, and each tube being generally configured to form a "U"; and

a liquid holding chamber surrounding said set of tubes and being adapted to be connected to a cooling system of the engine, whereby liquid heated by the engine would flow in said liquid holding chamber and heat said tubes.

4,192,271

REGULATING APPARATUS FOR A FUEL SUPPLY SYSTEM FOR A MIXTURE-COMPRESSING, EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE

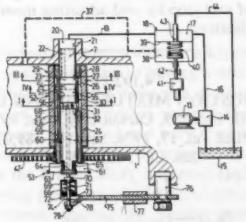
Klaus-Jürgen Peters, Affalterbach; Michael Wissmann, Gerlingen, and Peter Schelhas, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 905,302

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721864

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AW **5 Claims**

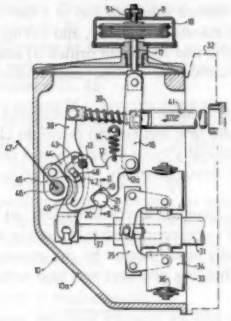


1. A regulating apparatus for a fuel supply system for a mixture-compressing externally ignited internal combustion engine with a pressure-regulating valve, whose movable valve member is influenced from one direction by fuel pressure and a pressure spring and from the other by a temperature-dependent element which effects a temperature-dependent alteration of pressure, further wherein said temperature-dependent element and said movable valve member cooperate with a relay pin, a regulating spring means arranged to encompass said relay pin, means supporting said regulating spring means, said last-named means being associated with said temperature-dependent element and wherein said temperature-dependent element is connected with said movable valve member below a predetermined temperature indirectly by means of said regulating spring means and above said predetermined temperature also directly by means of said relay pin.

4,192,272
CONTROL DEVICE FOR FUEL-INJECTED INTERNAL COMBUSTION ENGINES

Thomas Lang, Schwäbisch Hall, and Karl-Heinz Zoske, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,612
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 7717931
Int. Cl.[2] F02D *1/04;* F02B *77/00*
U.S. Cl. 123—140 MC 7 Claims

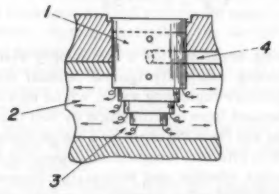


1. A control device for the fuel supply system of a fuel-injected internal combustion engine including a fuel metering device having a movable fuel quantity adjusting member, a housing, a stop supported on said housing, a correcting device which changes the adjusting path and/or the full-load position of said fuel quantity adjusting member of said fuel metering device in dependence on operation values, said fuel quantity adjusting member being arranged to be moved into abutting engagement with said stop, an electrical circuit including a signal indicator, means for connecting said stop and said adjusting member to said electrical circuit upon said abutting engagement of said adjusting member with said stop, said stop being provided with insulative means to prevent the grounding of said stop to said housing, said stop being capable of conducting current through said electrical circuit upon said abutting engagement of said stop by said adjusting member to energize said signal indicator.

4,192,273
COMBUSTION MIXTURE MIXING DEVICE

Stan Gray, P.O. Box 259, Carson City, Nev. 89701

Filed Jul. 17, 1974, Ser. No. 489,078
Int. Cl.[2] F02M *29/00*
U.S. Cl. 123—141 2 Claims



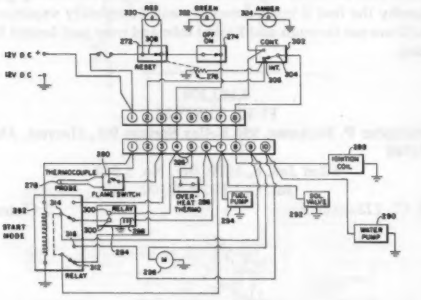
1. In combination with an internal combustion engine having an intake manifold, a device located upstream of the intake manifold for conveying combustibles into said manifold, said device comprising:

a plurality of tubular members having imperforate walls arranged concentrically about a common axis; and means mounting said tubular members so that one end of each tubular member extends through a side wall of the manifold, the lengths of each tubular member being such that said one end of each tubular member extends into the manifold a different distance with the outermost of said tubular members extending into the manifold the smallest distance, the innermost of said tubular members extending into the manifold the largest distance and any intermediate tubular members extending into the manifold by intermediate distances, said device being arranged so that the combustibles flow through the innermost tubular member and the spaces between the walls of the adjacent ones of said tubular members and then transverse to said one end of said tubular members upon entering the manifold.

4,192,274
DIESEL FUELED ENGINE COOLANT HEATER

Ralph S. Damon, 3892 W. 36th St., Cleveland, Ohio 44109

Division of Ser. No. 584,948, Jun. 9, 1975, Pat. No. 4,099,488.
This application Mar. 8, 1978, Ser. No. 884,633
Int. Cl.[2] F02N *17/02*
U.S. Cl. 123—142.5 R 7 Claims



1. A control system for a vehicle coolant fluid heater including accessories therefor, said heater including a combustion chamber, a fuel-primary air nozzle for admitting a fuel-primary air mixture into said combustion chamber, spark ignition means, means for admitting secondary and tertiary air into said combustion chamber, and means to circulate coolant fluid through said heater, said accessories including an ignition apparatus to energize the heater spark ignition means, a compressor-blower to supply primary, secondary and tertiary air to said heater, a fuel pump, a coolant fluid pump and a fuel shutoff solenoid valve; said control system comprising:

(a) a source of DC power;
(b) on-off switching means;
(c) circuit interrupting means;
(d) a two-position relay having a start mode and a run mode;
(e) said ignition apparatus, said fuel pump, said solenoid shutoff valve and said compressor-blower being activated upon the closing of said switching means to an "on" position and with said relay in the start mode;
(f) electrical timer means energized by said relay in the start mode, said timer means functioning to trip said circuit interrupting means after a predetermined timed interval if ignition in said combustion chamber has not been proven;
(g) a flame switch responsive to flame in said combustion chamber, the closing of said flame switch after the establishment of flame in said combustion chamber acting to switch said relay from the start mode to the run mode thereby deactivating said electrical timer means;
(h) said ignition apparatus, said compressor-blower, said fuel pump and said fuel shutoff solenoid valve being activated by said relay in the run position and with said switching means in an "on" position;
(i) a high temperature limit thermostat disposed in said coolant fluid and adapted to interrupt the electrical circuit to

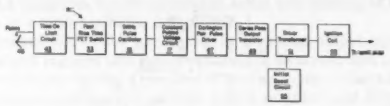
said fuel pump and said solenoid shutoff valve, the opening of said thermostat upon achieving a preset temperature in said coolant fluid serving to interrupt the flow of fuel to said heater.

4,192,275

ELECTRONIC IGNITION SYSTEM

Donald C. Weydemuller, 21418 Bloomfield Ave., #15, Lakewood, Calif. 90715

Filed Nov. 3, 1976, Ser. No. 738,283
Int. Cl.[2] F02P *3/04*
U.S. Cl. 123—148 E **4 Claims**



1. An electronic ignition system for use with an internal combustion engine ignition system and a relatively low direct current potential source, said internal combustion engine ignition system providing ignition timing signals, comprising:

triggered oscillator means including a relatively high frequency non-inductive free running energy generator for providing pulses of oscillator energy in response to relatively low frequency ignition timing signals;

a switch circuit including input terminals coupled between the input of said triggered oscillator means and said ignition timing signals;

a time-on limit circuit means coupled between the input of said triggered oscillator means and said ignition timing signals for limiting the on time of said switch circuit, said timing signals being produced by a set of ignition points in series with said potential source, said time-on limit circuit means including a collector/emitter junction of an input switching transistor connected to the input terminals of said switch circuit, said input switching transistor including a base coupled to said timing signals through a series coupling capacitor and having a timing/coupling capacitor discharge resistor for limiting the conducting time of said input switching transistor to a predetermined value greater than the slowest normal operating period of said system;

constant-current pulse circuit means responsive to the level of said direct current potential source and coupled to said oscillator means for providing constant current pulses of energy in response to said pulses of oscillator energy over potential levels of said direct current potential source above and below a nominal level; and

output circuit means coupled to said constant current pulsed circuit means for providing relatively high-potential, high-frequency, constant-current combustion initiating pulses of output energy in direct relationship to and over the entire frequency range of said ignition timing signals.

4. An electronic ignition system for use with an internal combustion engine ignition system and a relatively low direct current potential source, said internal combustion engine ignition system providing ignition timing signals, comprising:

trigger oscillator means including a relatively high frequency non-inductive free running energy generator for providing pulses of oscillator energy in response to relatively low frequency ignition timing signals;

constant-current pulse circuit means responsive to the level of said direct current potential source and coupled to said oscillator means for providing constant-current pulses of energy in response to said pulses of oscillator energy over potential levels of said direct current potential source above and below a nominal level;

output circuit means coupled to said constant-current pulsed circuit means for providing relatively high-potential, high-frequency, constant-current combustion-initiating pulses of output energy in direct relationship to and over the entire frequency range of said ignition timing signals; and

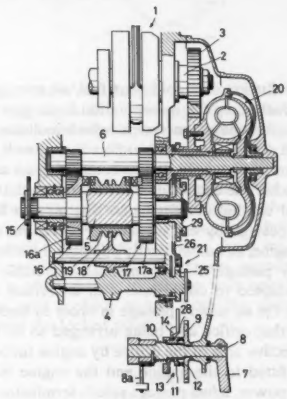
initial boost circuit means coupled to said output circuit means for storing potential energy prior to introducing a heavy load on said potential source, and supplying energy to said output circuit means at times when the potential of said potential source is reduced under heavy load conditions.

4,192,276

SAFETY ARRANGEMENT IN KICKSTART APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Takeo Ishihara, and Seishi Miura, both of Asaka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1978, Ser. No. 878,379
Claims priority, application Japan, Feb. 25, 1977, 52-21331[U]
Int. Cl.[2] F02N *17/00*; B60K *41/08*
U.S. Cl. 123—179 K **4 Claims**



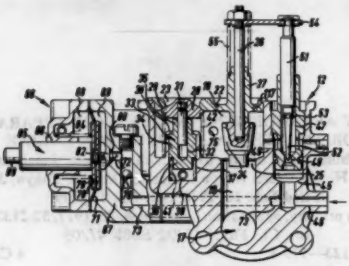
1. An improved safety arrangement in a kickstart apparatus for an internal combustion engine having a driving gear connected to a driving shaft at an input side of a power transmission, a shift drum being provided to shift the transmission between high speed, low speed and neutral stages by rotation of the shift drum, a starting gear connected to said driving gear in parallel with the driving shaft, a starting shaft loosely supporting the starting gear, a kick pedal on said starting shaft and clutch means interconnecting the starting gear and starting shaft comprising a movable half portion, a stationary half portion and spring means for engaging the clutch half portions upon rotation of the starting shaft, the improvement comprising: engaging claw means engageable with the movable half portion to arrest the same, and detecting means for detecting the positions of the shift drum corresponding to the stages of the transmission for selectively moving the claw means into engagement and disengagement with the movable half portion of the clutch means, said detecting means comprising, a pivotal lever movable by the shift drum, said claw means being integral with the lever; cam means coupled in rotation with the shift drum for moving the pivotal lever between a first position in which the claw means is disengaged from the movable half portion of the clutch means and a second portion in which the claw means is engaged with the movable half portion of the clutch means; and a roller on said pivotal lever engaged with said cam means.

4,192,277

AIR/FUEL RATIO METERING APPARATUS FOR USE WITH AN INTERNAL COMBUSTION ENGINE

Gray E. D. Ross, Tring, England, assignor to Zenith Carburetter Company Limited, Stanmore, England

Filed Nov. 2, 1978, Ser. No. 957,020
Int. Cl.[2] F02M 7/16; F02N 17/00
U.S. Cl. 123—179 G 9 Claims



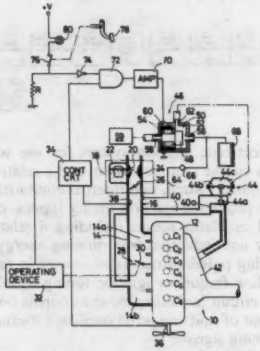
1. The combination of a cold start fuel/air mixture supply device and a fuel pump for incorporation in an internal combustion engine fuel induction system which includes a carburetter having a driver-operable throttle valve as well, the cold start fuel/air mixture supply device comprising an air supply passage which has one end for connection to the inlet manifold of the internal combustion engine so that air can be drawn through that passage by engine suction when the device is fitted to the engine, an automatically operable throttle valve in the air supply passage, the automatically operable throttle valve being adapted to co-operate with an orifice which is formed within the air supply passage in order to throttle fluid flow through that orifice and being arranged to be urged to reduce the effective area of the orifice by engine suction when the device is fitted to the engine and the engine is running under its own power, a fuel passage which terminates in a fuel discharge nozzle which is formed in the air supply passage upstream of the orifice, the fuel passage including fuel metering means for metering flow of fuel drawn through the fuel passage from a source of liquid fuel by a depression which is established within part of the air supply passage upstream of the orifice, and thermostatically-controlled means which are adapted to be responsive to the temperature of the engine to which the cold start fuel/air mixture device is fitted when used and which are operable to limit movement of the automatically operable throttle valve to reduce the effective area of the orifice as the temperature of the engine to which the device is fitted in use increases so that when the device is fitted to the engine and the engine has started to run under its own power, both the air flow in the air supply passage and the flow of fuel into the air supply passage through the fuel passage are decreased progressively with increase in engine temperature; and the fuel pump being adapted to draw liquid fuel from a source of liquid fuel and to pump that liquid fuel into the air/fuel induction system when the driver-operable throttle valve is opened so that the depression in the induction system downstream of the driver operable throttle valve decreases, the thermostatically-controlled means also being operable to modulate the performance of the fuel pump so that the amount of fuel that can be pumped into the induction system by the fuel pump when the combination is in use when the engine has started to run under its own power and when the driver-operable throttle valve is opened is reduced progressively with increase in engine temperature.

4,192,278

INTERNAL COMBUSTION ENGINE FOR MOTOR VEHICLE

Haruhiko Iizuka, Yokosuka; Fukashi Sugasawa, Yokohama; Junichiro Matsumoto, Yokosuka, and Yukihiro Etoh, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 4, 1978, Ser. No. 965,994
Claims priority, application Japan, Dec. 18, 1977, 52-170813[U]
Int. Cl.[2] F02D 17/02
U.S. Cl. 123—198 F 15 Claims



1. An internal combustion engine for a motor vehicle, having first and second groups of engine cylinders, comprising:

blocking means for blocking a supply of fuel and air into the second group of engine cylinders during a predetermined engine operation, when operated;

gas supply means for supplying a gas into the second group of cylinders during the operation of said blocking means, when operated; and

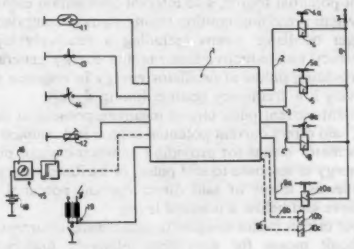
stopping means for stopping the operation of said gas supply means when said blocking means is operated and a brake pedal is depressed to slow down the speed of the motor vehicle.

4,192,279

METHOD AND APPARATUS FOR AUTOMATIC ENGINE SHUT-OFF AND RESTART

Wolfgang Maisch, Schwieberdingen, Fed. Rep. of Germany, and Rainer Burkel, Le Chesnay, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,236
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803145
Int. Cl.[2] F02B 75/12
U.S. Cl. 123—198 F 19 Claims



1. A method for automatic control of the motor of a motor

vehicle, comprising the steps of arresting the motor when each condition in a first set of conditions is determined to have been met, said first set of conditions including:

(A) the road speed of the vehicle falls below a minimum speed which is substantially equal to the lowest speed which the vehicle can have without stalling the motor when the drive line is engaged and being approximately 3 km/hour;

(B) the accelerator pedal is not depressed;

(C) the clutch pedal is not depressed; and

(D) a time period of selectable length T1 has elapsed since the previous passage of the vehicle speed through said minimum speed.

7. An apparatus for the automatic arrest and starting of the motor in a motor vehicle, comprising:

a control circuit for generating at least one output signal which engages said motor resulting in its arrest, said control circuit having a plurality of control input contacts and logical combinatory circuits which produce said output signal only if all of said control input contacts exhibit predetermined states;

a plurality of condition sensors, one of said condition sensors detecting the vehicle speed of said motor vehicle and including a threshold switch comprising a monostable multivibrator, said threshold switch generating an input signal for said control circuit when the vehicle speed falls below a selectable minimum speed of approximately 3 km/hour.

4,192,280

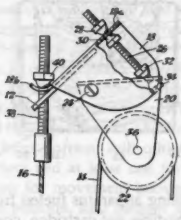
COMBINATION OF AN ARCHERY BOW AND ADJUSTABLE PULLEY ASSEMBLY

Lawrence C. Rickard, 580 Mentone Rd., Lantana, Fla. 33462

Filed Sep. 11, 1978, Ser. No. 941,266

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—23 R **1 Claim**



1. A combination of an archery bow with bow limbs and bow string, said combination further comprising a pulley assembly including

a first U-shaped housing connected to one of said bow limbs;

a second U-shaped housing pivotally mounted to said first housing, said second housing including a rotatably coupled pulley wheel for receiving said bowstring; and

a manual means for variably positioning said second pulley housing relative to said first housing.

4,192,281

CROSSBOW WITH TRIGGER LOCKING DEVICE

Fred V. King, 1605 S. Independence, Harrisonville, Mo. 64701

Continuation of Ser. No. 805,301, Jun. 10, 1977, abandoned. This application May 3, 1978, Ser. No. 902,297

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—25 **9 Claims**

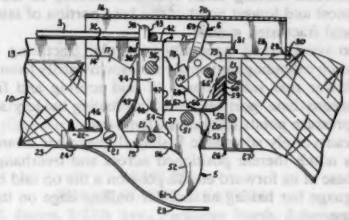
1. A trigger device for holding and releasing a crossbow string, comprising:

(a) housing means housing said trigger device and adapted for connection with a crossbow;

(b) holding means for a crossbow string, being rotatably mounted in said housing means and pivotable between first and second positions for holding and releasing said string respectively;

(c) trigger means mounted in said housing means and engaging a portion of said holding means and retaining said holding means in said first position when said trigger means is in a first trigger position; said trigger means being pivotable to a second trigger position wherein said trigger means is out of engagement with said portion and permits said holding means to pivot to its second position thereby releasing a crossbow string; and

(d) locking means mounted in a crossbow housing means and pivotable between a lock position and an unlock position; in said lock position, said locking means engaging said



trigger means and preventing rotation thereof from said first trigger position, thereby preventing a crossbow string release; in said unlock position, said locking means permitting rotation of said trigger means from the first to the second trigger position, thereby permitting a crossbow string release; said locking means releasably engaging said holding means during a portion of a crossbow string cocking operation, whereby rotation of said holding means by action of a crossbow bowstring, from the second to the first position of the holding means, automatically causes the holding means to engage and contemporaneously pivot said locking means from the unlocked position toward the locked position.

4,192,282

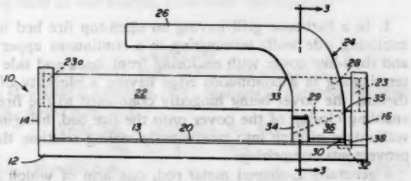
TILE CUTTER

John P. Fischer, 1064 Goffle Rd., Hawthorne, N.J. 07506

Continuation-in-part of Ser. No. 815,471, Jul. 14, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,536

Int. Cl.[2] B28P *1/32*

U.S. Cl. 125—23 T **1 Claim**



1. An improved tile cutter for scoring and fracturing ceramic tiles and the like, comprising:

a rectangular base member;

two resilient symmetrical, rectangular work surface pads positioned on the upper surface of said base;

a scoring blade channel along the longitudinal axis of said base member, separating said resilient work surface pads;

a recessed depression at the forward end of said scoring channel;

a pair of vertical support members positioned extending upwards from said base member;

an elongated rectangular guide rod secured at each end in grooves in said vertical support members, said guide rod positioned above and parallel to said scoring blade channel;

a tile scoring and fracturing means slidably mounted on said guide rod, comprising:

an L-shaped member having a horizontally oriented elongated handle portion, a downward sloping arcuate portion and a downward vertically oriented base portion;

said downward sloping arcuate portion having a guide channel with a downward and rearward sloping base to receive said guide rod and to permit said scoring and fracturing means to slide along said guide rod and to pivot arcuately;

a circular scoring blade rotatable secured to the forward most and lowest point of the base portion of said scoring and fracturing means;

two symmetrical, generally triangular fracturing arm fins, each extending outwardly and downwardly from opposed lower rear side surfaces of said scoring and fracturing means base portion; said fins having widely separated pressure points on their extreme ends;

a transversely adjustable L-shaped guage bar means having a notch therein positioned across and overhanging said base at its forward end to position a tile on said base, said guage bar having an angular trailing edge on its shorter leg.

4,192,283

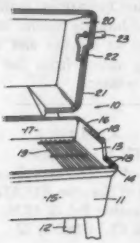
BARBECUE GRILL COVER POSITIONING MEANS

Edward L. Kridler, Lincolnshire; Marvin W. Eisenhauer, Antioch, and Loyal A. Huson, Round Lake Park, all of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,144

Int. Cl. F24b *3/00*

U.S. Cl. 126—25 AA **3 Claims**



1. In a barbecue grill having an open-top fire bed having enclosing side walls terminating in a continuous upper edge and shell-like cover with enclosing front, back and side walls terminating in a continuous edge having a plurality of slots therein, the cover being hingedly connected to the fire bed, enabling closing of the cover onto the fire bed, bringing the wall edges of each into substantially sealing relation, the improvements comprising:

a generally L-shaped metal rod, one arm of which has a thread thereon and extends through an opening in a side wall of the cover to extend outwardly of said cover and the arm of which is within the cover;

a bushing located within the cover side wall opening and receiving the threaded arm for rotation therein;

a tube of a heat insulator material received onto the threaded arm extending outwardly of the cover;

a generally cylindrical handle having a longitudinally extending bore, said bore being received onto the tube of a heat insulator material; and

a bushing secured within the handle bore for unitary movement therewith, said bushing having a slotted opening which is received onto a similarly shaped end portion of the L-shaped metal rod one arm such that rotation of the handle about the bore axis rotates the rod other arm for selective location in any one of the fire bed edge slots.

4,192,284

PORTABLE STOVES

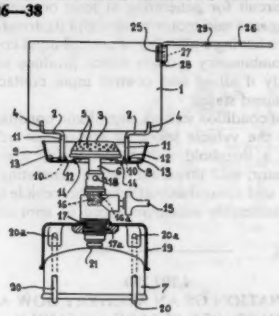
Marcel Vache, Sainte-Foy-les-Lyon, France, assignor to Application des Gaz, Paris, France

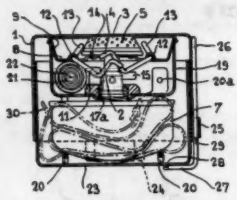
Continuation-in-part of Ser. No. 722,901, Sep. 13, 1976, Pat. No. 4,105,013. This application May 22, 1978, Ser. No. 908,424

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] F24C *5/20;* **F24B** *3/00;* **F23D** *13/04*

U.S. Cl. 126—38 **3 Claims**





1. A portable cooking apparatus fueled from a replaceable and pierceable combustible gas cartridge, comprising:

a dismountable stove for attachment to said cartridge, comprising:

a cover member shaped to receive said gas cartridge and means for securing said cartridge to said cover member,

a burner head,

an intermediate connecting element incorporating a cock, securable to said burner head and on said cover member, and having an element for connecting said burner head to said cartridge,

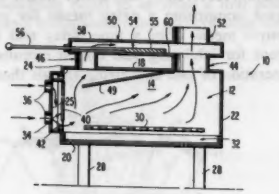
support arms for holding a sauce-pan above the burner head;

two pans respectively supportable above the burner head and serving as saucepans when the stove is in use, and within which the stove when not in use is storable, said pans being capable of telescoping one within the other with one facing the other, and the pans being shaped so that they comprise storage means telescopable from a relatively lower height inactive position wherein the cover member, burner head and connecting element are dismantled from one another and nested one within another and in the two pans, and telescopable to a relatively higher height active position wherein the cover member, burner head and connecting element are fitted to one another and to a cartridge, and nested in the two pans.

4,192,285
AIR TIGHT FUEL BURNING STOVE

Val J. Nietupski, Michigan City, Ind., assignor to Valco Corporation, Michigan City, Ind.

Filed Nov. 21, 1977, Ser. No. 853,529
Int. Cl.[2] F24C 15/28, 1/08
U.S. Cl. 126—83 7 Claims



1. A stove for holding and burning fuel to heat the surrounding atmosphere in a room, said stove comprising:

a housing having a fire box for supporting the fuel to be burned, the fire box having front, rear, upper and lower portions;

air inlet means located in the front portion of the fire box communicating between the fire box and the surrounding atmosphere for providing a flow path for air into the fire box from the atmosphere for combination with the fuel;

heating means cooperating with said air inlet for heating said air entering said fire box;

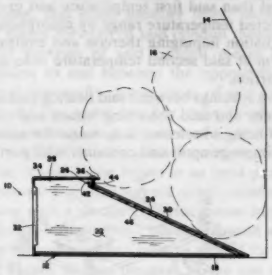
baffle means secured within said housing and located relative to the rear portion of the fire box for directing at least a portion of the volatile gases given off by burning fuel toward said heating means from the rear portion to the front portion of the fire box to mix with incoming air and achieve secondary combustion, said baffle means including a baffle extending downwardly from the upper portion between said front portion and rear portion toward said front portion to direct volatile gases formed during burning of a fuel toward said front portion; and outlet means disposed in the upper portion of said fire box for cooperating with said baffle means and directing said volatile gases toward the front portion, said outlet means including a rear outlet duct and at least one forward outlet duct, a damper means for movement between an open position and a closed position, said damper means in said closed position substantially impeding flow out of said rear outlet duct, whereby in said closed position said volatile gases will be directed by said baffle toward said front portion and in said open position at least a portion of said volatile gases will pass directly out of said rear outlet duct.

4,192,286
HEAT EXCHANGER

Garold L. Wormington, 600 S. Scenic, Springfield, Mo. 65802

Filed Dec. 27, 1977, Ser. No. 864,599
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 6 Claims

1. A method of producing heat from a fireplace which comprises providing an air chamber beneath a heat exchanger plate, supporting a source of fuel substantially immediately above the air chamber, directing a relatively thin stream of air to the proximity of the bottom of the fuel source during a burning operation, circulating air through the air chamber whereby relatively cool air is drawn into the air chamber and hot air is discharged therefrom into the area surrounding the fireplace, directing a relatively thin elongated stream of air into

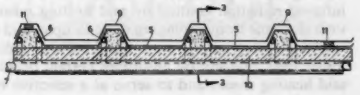


the fire area, and reducing the temperature of the heat exchanger plate during a burning operation.

4,192,287
SOLAR WATER HEATERS

George S. James, 5-13th Ave., Parktown North, Johannesburg, Transvaal, South Africa

Filed Dec. 6, 1977, Ser. No. 858,067
Claims priority, application South Africa, Dec. 15, 1976, 76/7471
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—449 5 Claims



4. A solar heat collecting panel comprising a sheet of metal formed as a roofing panel with inverted box ribs, conduits secured to the inside of the flanks of box ribs in heat conducting relationship, a solar radiation transmitting cover spaced from and continuous over the metal sheet and also formed to inverted box rib shape and so positioned that surfaces on the metal sheet are parallel to surfaces on the cover, insulating means sandwiched between the cover and the metal sheet around the area underlain by the conduits, and manifolds for feeding fluid to and leading fluid from the conduits.

4,192,288
MATERIAL HEATING APPARATUS

Anton H. Heller, Levittown, N.Y., assignor to Poweray Infrared Corp., Amityville, N.Y.

Filed Jul. 7, 1978, Ser. No. 922,779
Int. Cl.[2] E01C 19/45
U.S. Cl. 126—343.5 A 17 Claims

1. In an apparatus for heating and maintaining an asphalt material in a molten state at temperatures within a preselected range below the decomposition temperature of the asphalt material,

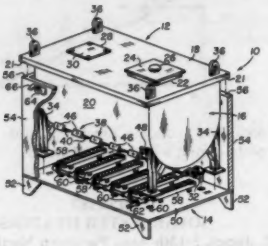
a container for holding an amount of the asphalt material in its molten state,

infrared heating means for emitting infrared radiation at a first temperature above the asphalt material decomposition temperature, said heating means being spaced from a portion of the wall of the container such that the emitted infrared radiation is directed at said container wall portion,

and heat absorbing means relatively spaced from said infrared heating means and said container wall portion and

interposed therebetween to receive infrared radiation emitted by the heating means to prevent the emitted radiation from impinging directly upon the container wall, said heat absorbing means being heated to a second temperature less than said first temperature and greater than the preselected temperature range by absorption of the infrared radiation impinging thereon and emitting secondary radiation at said second temperature onto said container wall portion,

the relative spacings between said heating means and absorbing means and said absorbing means and container wall portion being so selected as to cause the secondary radiation to impinge upon said container wall portion at a third



temperature less than said second temperature and within the preselected range so as to maintain the temperature of the asphalt material in contact with the container wall portion within the preselected range below the decomposition temperature of the asphalt material, said heat absorbing means being inperforate and being between said heating means and container wall so as to intercept the infrared radiation emitted by said heating means to prevent the same from impinging directly upon said container wall and to convert the heat of sad infrared radiation to a lower heat intensity by absorbing certain of said heat of said heating means and to serve as a selective regulating control of the heat acting upon said container wall.

4,192,289

SOLAR HEAT COLLECTION SYSTEM

David J. Clark, 118 Nobscot Rd., Sudbury, Mass. 01776

Filed Jun. 8, 1978, Ser. No. 913,873
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—425 **22 Claims**

1. Solar energy collection apparatus comprising:

a reflector means comprising a frame and a plurality of discrete reflector segments with light reflecting surfaces and supported by said frame means in an array having a substantially paraboloidal shape;

drive means for producing rotational movement of said frame about first and second axes;

control means for energizing said drive means so as to produce sun tracking movement of said array, said control means comprising a sensor means responsive to the orientation of received sunlight;

a stationary collector means with a light collecting surface positioned to receive reflected energy from each of said reflector segments, said light collection surface being spaced from said light reflecting surfaces in a substantially southern direction; and

sensor drive means responsive to said control means for maintaining said sensor means in alignment with the sun.

21. Solar energy collection apparatus comprising:

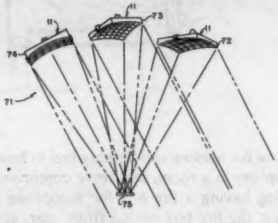
receiver means for receiving energy from the sun;

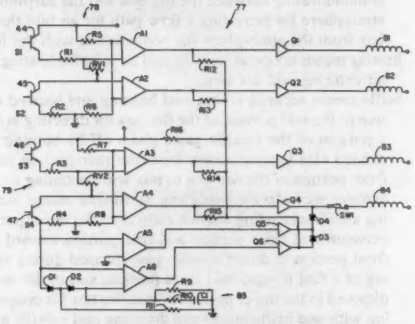
a frame means supporting said receiver means;

drive means for producing movement of said frame means;

control means for energizing said drive means so as to produce sun-tracking movement of said frame means, said control means comprising a sensor means responsive to received solar radiation said control means comprising a balanced bridge circuit including a plurality of sensors responsive to solar radiation, and a plurality of output circuits for providing energizing signals to said drive means; and

de-activation means for de-activating said control meams in response to a predetermined decrease in the level of solar radiation received by said sensor means, said de-activation means comprising a delay means for re-activating said control means after a time delay and inhibit amplifier means for inhibiting said output circuits to prevent the generation of said energizing signals thereby in response





to said predetermined decrease in the level of radiation received by said sensor means, said inhibit amplifier means having one input responsive to said level of solar radiation, a second input responsive to a signal level provided by said delay means and an output connected to said plurality of output circuits, and said de-activation means further comprising a capacitor means connected to said second input and charged in response to increases in the level of solar radiation received by said sensor means, and resistor means for discharging said capacitor means in response to decreases in the level of said receiving radiation.

4,192,290

COMBINED SOLAR COLLECTOR AND ENERGY STORAGE SYSTEM

Ronald N. Jensen, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 900,843
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—437 **6 Claims**

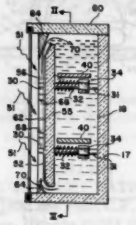
1. A combined solar energy collector, fluid chiller, and energy storage system comprising:

(a) a tank for containing a liquid;

(b) a solar energy collector surface forming a wall of said tank;

(c) a thermal insulation means for thermally insulating said liquid contained in said tank from the exterior environment of said tank, said thermal insulation means including a thermal insulation panel located inside said tank, the major surface of said panel being parallel with the collector wall;

(d) thermally responsive panel moving means positioned to move the insulating panel to or from a first position in which the panel is displaced from said collector surface to



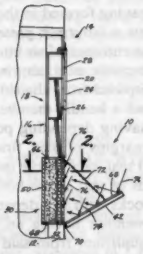
allow the liquid to move into contact with the collector surface, to a second position where the panel affronts the collecting wall; whereby heat transfer between said liquid and said collector wall is controlled by the movement of said thermal insulation panel between said first and second positions while maintaining the parallel relationship between said collector wall and said thermal insulation panel said panel in said second position forms with the other surfaces of said tank an insulating enclosure for said liquid.

4,192,291

SOLAR WATER HEATER

Asa S. Arent, 700-15th St., Humboldt, Iowa 50548

Filed Jul. 21, 1978, Ser. No. 926,749
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—439 **1 Claim**



1. A solar water heater comprising,

a frame means having upper and lower ends, spaced apart sides, and forward and rearward ends, said rearward end being adapted to be inwardly disposed of a building wall,

a conduit means having horizontal portions and inlet and outlet ends, said conduit means being securely mounted within said frame means in a sinuous planar configuration, said inlet end being adapted for connection to a supply of water and said outlet end being adapted for connection to a hot water storage tank, said conduit means having an outer surface adapted to absorb solar energy,

a first reflector means mounted within said frame means rearward of said conduit means and having a forwardly disposed non-planar reflector surface, said non-planar reflector surface of said first reflector means being corrugated transversely with the ridges being parabolic shaped in cross section and inwardly disposed,

a transparent non-planar first panel member having transversely extending corrugated ridges of a parabolic shape in cross section and being outwardly disposed, and positioned opposite to the inwardly disposed corrugations of said first reflector means, to allow passage of solar energy to said conduit means, said panel member being mounted within said frame means forward of said conduit means,

the horizontal portions of said conduit means dwelling in spaced relation to and between the oppositely positioned inwardly and outwardly corrugations of said first reflector means and said first panel member, respectively,

a second panel member hingedly secured to said frame means and being rotatable from a closed position enclosing said forward end of said frame means to an open position exposing said forward end, said second panel member having an inner surface with a second reflector means thereon,

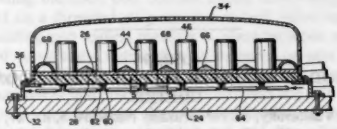
connection means for adjustably positioning said second panel member in various positions relative to said forward end of said frame means so that the rays of the sun striking said second reflector means may be reflected through said first panel member to said conduit means.

4,192,292

SOLAR HEATING SYSTEM

Edward J. Root, P.O. Box 169, Old Saybrook, Conn. 06475

Filed Mar. 27, 1978, Ser. No. 890,206
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—448 **8 Claims**



1. A solar collector matrix assembly comprising:

a support member of generally flat sheet material having a substantially checkerboard design on its surface, alternating polygons thereof having circular holes formed therein whose outer circumferences are generally tangential to the perimeters of their associated polygons;

a matrix of collector elements arranged on said support member in a series relationship including a plurality of cylindrical beverage containers of the convenient opening variety, each including a first end which is sealed and a second end having a continuous edge defining an opening therein, each of said containers being received within an associated hole and mounted on said support member, a longitudinal axis of each of said containers being transverse to a plane of said support member, and each of said containers having a coating of a heat and light conductive substance;

a resilient plug having a pair of spaced apertures mounted in the opening of each second end and a groove extending along its perimeter for positive engagement with said continuous edge thereby effectively sealing the opening;

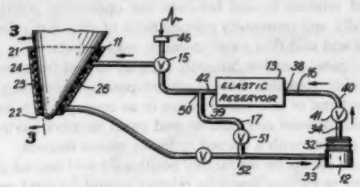
first and second collector tubes fittingly received respectively through the apertures in said plug and extending from outer ends positioned at locations outside of said container to inner ends positioned at locations within said container, the inner end of said first collector tube terminating nearer to the first end of said container than the inner end of said second collector tube; and

a conduit connecting said second tube of one of said containers to said first tube of an adjacent one of said containers such that all of said containers in said matrix are thereby connected in a series relationship.

4,192,293
CARDIAC ASSIST DEVICE

Manfred Asrican, Baldwin Farms South, Greenwich, Conn. 06830

Filed Sep. 5, 1978, Ser. No. 939,343
Int. Cl.[2] A61H 29/00
U.S. Cl. 128—1 D 6 Claims

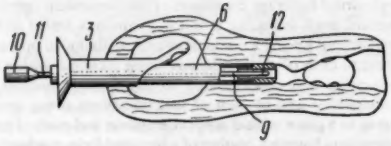


1. An improved cardiac assist device comprising: a hollow rigid sheath of generally frusto-conical configuration adapted to be surgically implanted to surround the myocardium of a patient; an inflatable bladder mounted upon the inner surface of said sheath, and having means for input and return flow of a pressurized fluid from an external source; a reciprocating pump adapted to be worn by said patient, and driven by respitation movement of the diaphragm of said patient; an elastic reservoir connected in series with said pump, a valve in series with said reservoir and communicating with said bladder; means sensing the heartbeat of said patient and providing a signal controlling said valve in synchronism therewith; and conduit means for returning fluid from said bladder to said pump.

4,192,294
METHOD OF REMOVING CONCRETIONS FROM THE URETER

Petr N. Vasilevsky, bulvar Druzhby Narodov, 8, kv. 27; Boris S. Gekhman, ulitsa Parizhskoi kommuny, 22-b, kv. 24; Ivan V. Parfinenko, ulitsa Kochubeevskaya, 12a, kv. 1; Alfred M. Podgursky, pereulok Elektrotekhnichesky, 3, kv. 10, and Avram S. Lazaretnik, Rusanovsky bulvar, 12, kv. 69, all of Kiev, U.S.S.R.

Filed Oct. 11, 1977, Ser. No. 840,763
Int. Cl.[2] A61B 19/00, 17/00
U.S. Cl. 128—1 R 10 Claims



1. Method of removing a concretion from a ureter containing a concretion, which comprises

placing a vibratory means in the ureter cystoscopically through the urethra and the bladder,

advancing said vibratory means through the ureter to the flexure thereof below and not in contact with the concretion,

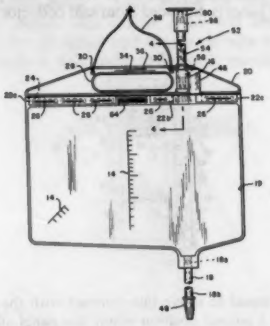
supplying power to said vibratory means inducing vibrations which act upon the inner surface of the ureteral walls and stimulate peristaltic contractions of the ureter, and

withdrawing said vibratory means from the ureter, said stimulated peristaltic contractions being sufficient to cause said contained concretion to move through and out of the ureter, after said vibratory means has been withdrawn, without the concretion having been physically contacted by any instrument.

4,192,295
BEDSIDE DRAINAGE BAG

Hugh P. Sherlock, Palo Alto, Calif., assignor to M.U. Engineering & Mfg. Co., Mountain View, Calif.

Filed May 2, 1977, Ser. No. 792,971
Int. Cl.[2] A61F 5/46
U.S. Cl. 128—295 9 Claims



1. In a urinary drainage bag, first and second sheets of flexible material having upper, side and lower margins, and being disposed to form adjacent side walls of the bag, an inlet tube having a portion disposed between said upper margins of said first and second sheets, said inlet tube portion being offset from the center of said upper margins and adjacent one of said side margins of said first and second sheets, an outlet tube having one end portion thereof disposed between the lower margins and adjacent said one of said side margins of said first and second sheets and in alignment with said inlet tube portion, a peripheral seal bonding said sheets together along substantially their entire peripheries and also bonding said sheets about said inlet tube portion and said outlet tube portion to form a closed bag within said peripheral seal, said bag having openings for the passage of liquid only by way of said inlet tube and said outlet tube said bag having formed in the upper margin of the first and second sheets a labyrinth passageway which establishes a passage for the entrance of air into the bag while inhibiting the passage of bacteria, said labyrinth passageway being generally centrally disposed from the side margins of the first and second sheets, and a handle member formed of substantially rigid material having depending portions which extend between the upper margins of said first and second sheets outside said peripheral seal, said handle member being attached to said bag by portions of said sheets bonded to each other in a pattern which interlocks with said depending portions of said handle, said handle member having an opening therein disposed substantially equidistant from said side margins of said sheets to permit insertion of a hand to facilitate carrying of the bag.

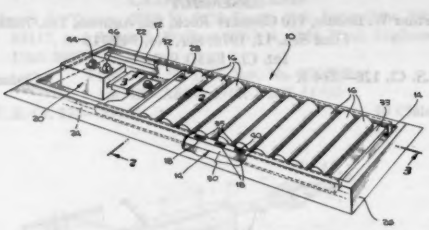
4,192,296
MASSAGE MACHINE

Ronald J. St. Mary, P.O. Box 25574 Hawaii Kai, Honolulu, Hi. 96825

Filed Apr. 12, 1978, Ser. No. 895,540
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—52 6 Claims

1. In a lightweight, portable massaging platform: a rectangular frame member including track members extending longitudinally of said frame member, a moveable carriage member, a plurality of free rotating roller elements retained in transverse parallel arrangement by said carriage member and moveable therewith, means for reciprocating said carriage member in said frame member, the remote ends of said roller elements being journaled in self-contained bearings, said bearings being movably supported on said track members independently of

the rotation of said roller elements, said carriage member being supported by said bearings for reciprocal motion in said frame



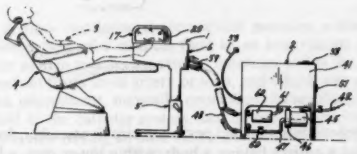
member along said track members whereby said carriage member moves independently of the rotation of said roller elements.

4,192,297

THERAPEUTIC FEET BATHING DEVICE

Léopold Labrecque, 1458 des Pins, C.P. 425, Riviére du Moulin, Chicoutimi, Quebec, Canada (G7H 1C8)

Filed May 17, 1978, Ser. No. 906,911
Int. Cl.[2] A61H *9/00*
U.S. Cl. 128—66 **14 Claims**



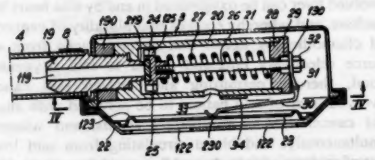
1. A therapeutic feet bathing device comprising a feet enclosure including a tub portion, a hood portion, a pair of apertures in one side of the feet enclosure for insertion of one's legs therein with the feet overhanging inside the feet enclosure, seal means extending around said apertures and sealingly engaging the legs therein, a liquid jet device mounted in said feet enclosure and operatively producing liquid jets impinging against the one's feet in the enclosure upon supplying liquid under pressure thereto, and an adjustable stand including a base section, and a support section carrying said feet enclosure and vertically adjustable relative to said base section.

4,192,298

BREATHING APPARATUS WITH IMPROVED REGULATOR PARTICULARLY FOR UNDER WATER USE

Lugi Ferraro; Gianni Beltrani, both of Genes, Italy; Jacques Gass, Villeneuve-Loubet, and Bernard Trochon, Carros-le-Neuf, both of France, assignors to La Spirotechnique Industrielle et Commerciale, France; Technisub S.p.A., Genoa, Italy

Filed Oct. 11, 1977, Ser. No. 842,330
Claims priority, application Italy, Oct. 13, 1976, 12838 A/76
Int. Cl.[2] A62B *7/04*; B63C *11/16*; *11/22*
U.S. Cl. 128—205.24 **1 Claim**



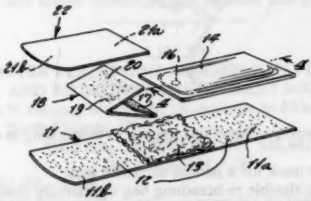
1. In a diving breathing apparatus of the two-stage pressure reducing type comprising first stage valve means adapted to be connected to a diving cylinder containing a respiratory gas under high pressure for the reduction of said gas from high pressure to medium pressure, second stage valve means connected to said first stage for the reduction of said gas from medium pressure to breathable pressure, a mouth-piece associated directly to said second stage means, means responsive to each inhalatory lifting suction from the user which exceeds a minimum threshold to open said second stage means to supply respiratory gas to said mouthpiece under breathable pressure, and means to oppose a force to said lifting suction thereby to establish said threshold; the improvement in which the said first stage valve means comprises a valve body having an admission duct receiving said gas under high pressure, throttling valve means in said valve body, spring means biasing said valve means to its open position, a chamber in said valve body, and manually operated control means for adjusting the setting of said spring means, whereby said medium pressure may be adjusted by the user in order to adjust said threshold, said throttling valve means comprising a seating member inserted in said valve body and a piston slidably mounted in said chamber and dividing said chamber into first and second compartments, said spring means being positioned in said first compartment, - said piston having fixed thereon a tubular rod having a bore extending through said rod and said piston and provided at one of its extremities with a nozzle adapted to come into sealed abutment with said seating member, said admission duct communicating with said seating member and the outer side of said nozzle when said nozzle is seated on said seating member, said admission duct communicating with said second compartment through said tubular rod when said nozzle is spaced from said seating member, said control means comprising a knob screwed on a threaded plug secured on said valve body, said plug holding said seating member in place between said plug and said valve body, a disc slidably mounted on said rod and located in said first compartment and a plurality of pins slidably mounted in said body between said knob and said disc and in abutment against them, the aforesaid loading spring means being inserted between said piston and said disc whereby the setting of said spring means and consequently the adjustment of said threshold is obtained by screwing and unscrewing said knob.

4,192,299

BANDAGE THAT CONTAINS ANTISEPTIC

Frank Sabatano, 1726 Colden Ave., Bronx, N.Y. 10462

Filed Aug. 25, 1978, Ser. No. 936,716
Int. Cl.[2] A61F *13/00*, *7/02*
U.S. Cl. 128—155 **2 Claims**



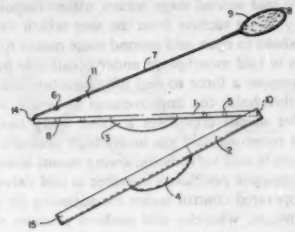
1. A bandage, comprising in combination an elongated first tape having adhesive upon one side thereof, a gauze pad adhered upon a center thereof, an envelop containing antiseptic medication being adhered upon a first end of said tape, said envelop overlapping upon said pad and having a dispensing outlet in an underside thereof for discharging said medication upon said pad wherein an auxillary, second tape is adhered at one end on an underside of said envelop to seal said outlet, an opposite end of said second tape being adhered to a first end of a cover which at its opposite end is adhered upon a second end of the first said tape.

4,192,300

BANDAGE WITH INTEGRATED APPLICATOR

John C. Devers, 7004 Armat Dr., Bethesda, Md. 20034

Filed Jun. 6, 1978, Ser. No. 913,121
Int. Cl.[2] A61L *15/00*
U.S. Cl. 128—155 14 Claims



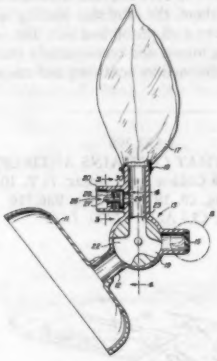
1. A unitary bandage comprising a flexible or semi-rigid backing having adhesive material applied to one side and an absorbent pad centrally disposed on said backing, applicator means for applying said bandage removably attached to said backing and disposed to extend vertically from the top surface thereof whereby to permit pressure to be applied downward against said backing, and bottom cover means removably attached to said backing for covering the adhesive side of the backing and the lower surface of said pad.

4,192,301

RE-BREATHING APPARATUS

Charles W. Hardwick, 712 W. 25th St., Sanford, Fla. 32771

Filed Nov. 6, 1978, Ser. No. 957,872
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—205.17 10 Claims



1. A disposable re-breathing apparatus comprising in combination:

disposable mask for a patient to breath into;

disposable, flexible re-breathing bag operatively coupled to said mask;

air control valve means connected between said mask and said bag and providing a bi-directional flow path therebetween and having a fresh air inlet connecting said air control valve means to the open atmosphere;

a check valve operatively attached to said fresh air inlet to prevent the exhaling of air from said fresh air inlet; and

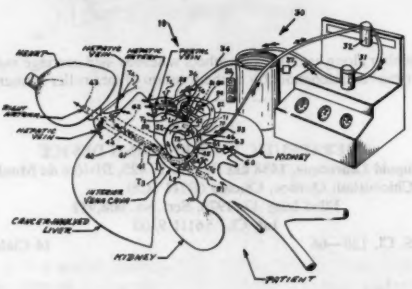
said air control valve means having valving means for varying the ratio of air breathed by a patient from said mask between re-breathed air from said bag and fresh air from said fresh air inlet, thereby providing a greater control of re-breathing by patients.

4,192,302

HEPATIC ISOLATION AND PERFUSION CIRCUIT ASSEMBLY

Arthur W. Boddie, 110 Chimney Rock, San Antonio, Tex. 78231

Filed Sep. 12, 1978, Ser. No. 941,715
Int. Cl.[2] E03D *9/04*
U.S. Cl. 128—214 R 5 Claims



1. A hepatic isolation and perfusion circuit assembly, for use in treating a patient having a body with a lower part, a heart with a right atrium, a portal vein, a hepatic artery, intestines, kidneys, a liver involved with cancer, blood in a blood general circulatory system, with a portion of said blood circulating in and through said cancer-involved liver, wherein said blood circulating in said liver includes a hepatic venous outflow, comprising:

a. a source of a plurality of cancericidal chemotherapy agents for perfusing said cancer-involved liver;

b. a heart-lung machine, operatively connected to said source of said cancericidal chemotherapy agents, wherein said machine includes an inlet, an outlet that is bifurcated into a first branch catheter and a second branch catheter, and a source of oxygen, and wherein said first branch catheter of said bifurcated outlet is removably inserted into, is conformably engaged with, and is releasably secured to said hepatic artery of said patient, and also wherein said second branch catheter of said bifurcated outlet is removably inserted into, is conformably engaged with, and is releasably secured to a preselected location at and in said portal vein of said patient;

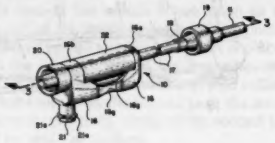
c. and, means for selectively isolating said patient's cancer-involved liver, and said blood that is circulating therein, from said general blood circulatory system of said patient, with this said means releasably connected to said heart-lung machine;

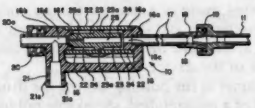
whereby said blood circulating in and through said cancer-involved liver can be oxygenated in and by said heart-lung machine, and whereby each of said plurality of cancericidal chemotherapy agents can be introduced from said source selectively into and added to said oxygenated blood, thereby permitting and causing said cancer-involved liver of said patient to be perfused with any of said cancericidal chemotherapy agents, and whereby, simultaneously, said blood circulating from said lower part of said patient's body and from said intestines of said patient is allowed to continue to flow and to circulate unimpeded to said patient's heart.

4,192,303
FLOW REGULATING DEVICE FOR ARTERIAL CATHETER SYSTEMS

James E. Young, 2080 E. 4675 South, Salt Lake City, Utah 84117, and Ralph S. Walker, 9767 N. 6530 West, Highland, Utah 84003

Filed Jun. 29, 1978, Ser. No. 920,500
Int. Cl.[2] A61M 5/00; F16K 51/00
U.S. Cl. 128—214 R 10 Claims



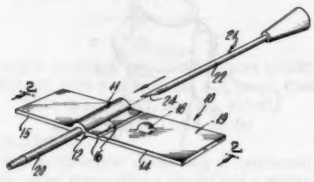


1. A flow regulating device which provides a continuous regulated flow of a medical fluid to an intravenous catheter system used in monitoring arterial functions and in the infusion of medical fluids to an artery or vein, and which also provides for an intermittent, manually controlled, larger flushing flow of fluid to the catheter system, said device comprising a control member having an inlet means adapted to be connected to a source of a medical fluid and an outlet means adapted to be connected to an intravenous catheter; a first passage connecting said inlet and outlet means for fluid flow communication therebetween, said first passage at least in part comprising a section of flexible conduit having valve means positioned therein, said valve means being adapted to open and permit said larger, flushing flow of fluid to pass through said first passage when the conduit is deformed by applying an external force thereto and to close when the external force on the conduit is released; and a second passage by-passing said valve means and connecting said inlet and outlet means, said second passage containing flow restriction means which limits the flow of fluid therethrough, under a given pressure to a desired amount.

4,192,304
INTRAVENOUS CATHETER ASSEMBLY WITH FLUID FLOW RESTRICTION CAPABILITY

Marcus J. Millet, New York, N.Y., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 14, 1978, Ser. No. 886,498
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 10 Claims

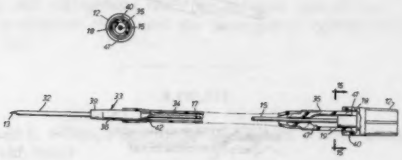


1. An intravenous catheter assembly comprising: a compressible hub having a bore therethrough; a hollow catheter having one end connected to said bore whereby fluid is adapted to flow through said bore and said catheter; a pair of generally oppositely extending wing sections connected to said hub, at least one of said wings being hingedly connected to said hub to allow said wing to fold over said hub, said hingedly connected wing including pinching means thereon for contact with said hub when said wing is folded thereover whereby, in use, said folded wing urges said pinching means against said compressible hub causing it to collapse and occlude said bore and thereby restrict fluid from passing therethrough.

4,192,305
CATHETER PLACEMENT ASSEMBLY HAVING AXIAL AND ROTATIONAL ALIGNMENT MEANS

Charles H. Seberg, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 21, 1978, Ser. No. 935,441
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 14 Claims



1. In an intravenous catheter assembly including
(1) a catheter unit comprising:
(a) a flexible plastic catheter having a distally tapered distal end,
(b) a winged catheter insertion means having a lumen therethrough, the proximal end of said catheter in communication with said lumen of said catheter insertion means via its distal end,
(c) a flexible tubing having its distal end in communication with said lumen of said catheter insertion means via its proximal end,
(d) a tube hub having a lumen therethrough, the proximal end of said flexible tubing in communication with said lumen of said tube hub via its distal end, and
(2) a needle inserted through said catheter, winged catheter insertion means, flexible tubing and tube hub, said needle having a sharpened distal end extending beyond said distal end of said catheter and a proximal end attached to a needle hub; the improvement which comprises:
complementary means associated with said lumen of said winged catheter insertion means and said needle mechanically interlocked to provide axial and rotational alignment of said needle relative to said catheter unit at all times.

4,192,306
CATHETER PLACEMENT ASSEMBLY HAVING AXIAL AND ROTATIONAL ALIGNMENT MEANS

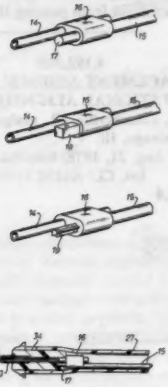
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 21, 1978, Ser. No. 935,442
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 12 Claims

1. In an intraveneous catheter assembly including
(1) a catheter unit comprising:
(a) a flexible plastic catheter having a distally tapered distal end,
(b) a winged catheter insertion means having a lumen therethrough, the proximal end of said catheter in communication with said lumen of said catheter insertion means via its distal end,
(c) a flexible tubing having its distal end in communication with said lumen of said catheter insertion means via its proximal end,
(d) a tube hub having a lumen therethrough, the proximal

end of said flexible tubing in communication with said lumen of said tube hub via its distal end, and

(2) a needle inserted through said catheter, winged catheter insertion means, flexible tubing and tube hub, said needle having a sharpened distal end extending beyond said distal end of said catheter and a proximal end attached to a needle hub; the improvement which comprises:



complementary means associated with said lumen of said winged catheter insertion means and said needle mechanically interlocked to provide axial and rotational alignment of said needle relative to said catheter unit at all times, wherein said needle comprises a first portion extending a predetermined distance from said distal end toward said proximal end and spliced to a second portion in juxtaposition to said first portion, which second portion extends to said proximal end of said needle.

4,192,307

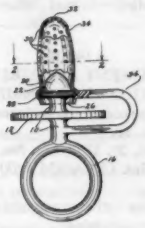
PACIFIER WITH SWEETS-DISPENSING NIPPLE

Alan R. Baer, 14926 Plank Rd., Union Grove, Wis. 53182

Filed May 31, 1978, Ser. No. 911,275

Int. Cl.[2] A61J *11/00, 17/00*

U.S. Cl. 128—252 **3 Claims**



1. A pacifier of pliable molded material and strictly of one piece unitary construction, and having an axial body, comprising a guard integral with said body and lying in a plane normal thereto, a nipple having a chamber, and provided with a plurality of perforations peripherally-positioned on the surface thereof, said chamber terminating in an axial opening, a sealing plug integral with said body and axially co-operating to seal said opening, and a strap intimately integral with said nipple as one piece with said body.

4,192,308

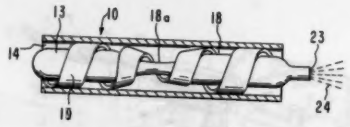
DEVICE USING PRESTRETCHED POLYMER FOR DISPENSING MEDICATION

Alan S. Michaels, San Francisco, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 844,968, Oct. 25, 1977. This application Dec. 26, 1978, Ser. No. 972,776

Int. Cl.[2] A61M *31/00*

U.S. Cl. 128—260 **8 Claims**



1. A drug dispensing device comprising:

(a) a drug;

(b) a housing made of a shape-retaining wall forming material surrounding and defining an internal space, said wall having at least one opening connecting the space with the exterior of the device,

(c) a container in the housing storing the drug, the container formed of a prestretched, shrinkable polymer prepared by inducing molecular orientation by uni-axially and bi-axially stretching the polymer into an expanded high energy state, said stretched, shrinkable polymer having reserve elastic recovery to an unstretched polymer, and which container has a passageway formed in the polymer that projects through the opening for dispensing drug from the container to the exterior of the device;

(d) a laminate in the housing surrounding the exterior of the container, said laminate comprising a lamina of an absorbent material and a lamina of a swellable hydrophilic polymer; and,

(e) wherein, in operation when the device is present in an environment containing a biological fluid, the laminate imbibes fluid into the housing urging the laminate to swell and exert pressure on the stretched polymer thereby causing said polymer to recover to an unstretched polymer and concurrently therewith decrease in volume of the container, thereby pumping drug through the passageway from the device at a controlled rate over a prolonged period of time.

4,192,309

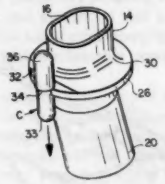
INHALATION DEVICE WITH CAPSULE OPENER

Boyd J. Poulsen, Palo Alto, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Filed Sep. 5, 1978, Ser. No. 939,614

Int. Cl.[2] A61M *15/06, 15/08*

U.S. Cl. 128—203.15 **1 Claim**



1. A breath-actuated inhalation device for dispensing a powdered medicament from a powdered medicament-holding container, which device comprises an elongate housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into

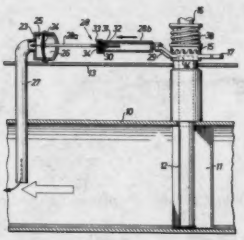
the mouth or nasal passage of a user thereof, the passageway having an inlet end terminating in an emptying chamber at the output end of said housing, the cross-sectional area of the passageway being less than the cross-sectional area of the emptying chamber, means associated with said housing for receiving a powdered medicament-holding container, a collar which surrounds at least a portion of the periphery of said housing adjacent the emptying chamber, said collar having at least one substantially flat surface thereon, and a notch within said flat surface of said collar, the notch being of such a size to allow a first, smaller part of a two-part medicament-holding container to fit therein but which is too small to allow the second, larger part of the medicament-holding container to fit therein, whereby when the smaller, first part is placed within the notch with the leading edge of the larger, second part of the container contacting said flat surface of said collar, and the first part is pulled away from the second part, the medicament-holding container is opened by virtue of the second larger part being retained by said flat surface.

4,192,310

DEVICE IN FLUE GAS DAMPERS

Eric Brodin, Monte Carlo, Monaco, assignor to Etablissements Unicor, Vaduz, Liechtenstein

Filed Jan. 31, 1978, Ser. No. 873,947
Claims priority, application Sweden, Feb. 4, 1977, 7712359
Int. Cl.[2] F23L *3/00*
U.S. Cl. 126—286 **10 Claims**



1. A device in flue gas dampers intended for flue gas passages, of the type comprising a pivotable damper plate (11) which is connected to a regulating means for automatic adjustment of the damper plate betwen a closed position and an open economical operation position in response to the operating condition of an installation connected to the flue gas passage, for adjusting the economical operating position to prevailing outside wind conditions, characterized in that the regulating means comprises a means (23), sensitive to gas pressure, and arranged to be actuated by the gas pressure in the flue gas passage (10) downstream of the damper plate (11) and which is connected to the damper plate in such a way that the degree of opening of the damper plate in the economical operation position is decreased for decreasing gas pressure in the flue gas passage.

4,192,311

DISPOSABLE DIAPER WITH WETNESS INDICATOR

James J. Felfoldi, 1919 Frankfort St., San Diego, Calif. 92110

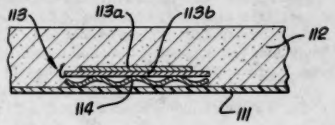
Filed Dec. 5, 1977, Ser. No. 857,672
Int. Cl.[2] A61F *13/16, 13/00*
U.S. Cl. 128—287 **7 Claims**

1. In a disposable article comprising a translucent sheet of substantially water impervious material and a moisture absorbent pad closely associated with the sheet, the combination comprising

(a) a visual indicator proximate said sheet, and

(b) a mask between said indicator and said sheet, said mask characterized when dry as masking the visibility of said indicator through the sheet, and further characterized when wet as unmasking said visibility by becoming translucent,

(c) said indicator comprising a coloring agent together with material which becomes stained by the agent when wet, the agent located between the mask and said material, the mask periphery extending a substantial distance into the



pad free of the indicator to wick moisture into the mask and thereby expose the indicator,

(d) the mask being corrugated to define moisture receiving open space between the sheet and indicator,

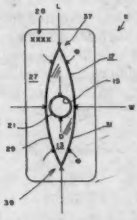
(e) said corrugations retain the indicator spaced from the translucent sheet until the corrugations collapse when wet.

4,192,312

SURGICAL INCISION GUIDE MEANS

Donald L. Wilson, 5 Bon Air Rd., Sohner Plz. #127, Larkspur, Calif. 94939

Filed Sep. 1, 1978, Ser. No. 938,804
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—303 R **12 Claims**



1. Surgical incision guide means for aiding a physician in making an optimum size and shape incision with respect to skin tumors and like ailments, said guide means comprising patch-like means for placement upon and contiguously engaging the skin of the patient, said patch-like means being provided with an opening centrally disposed thereof for aiding in placing said patch-like means in an optimum location with respect to the tumor, and said guide means including delineation means extending in a substantially elliptical shape for readily providing a substantially elliptical pattern which prescribes an optimum size and shape for the particular incision and for defining the boundary of an area of the patient's skin to be excised.

4,192,313

FORCEPS DESIGNED TO FACILITATE INSERTION OF A LAMINARIA TENT INTO THE UTERINE CERVIX

Noboru Ogami, 34 Gartley Pl., Honolulu, Hi. 96817

Filed Feb. 10, 1977, Ser. No. 767,546
Int. Cl.[2] A61B *17/28*
U.S. Cl. 128—321 **2 Claims**

1. A forceps for the insertion of a Laminaria tent into the uterine cervix comprising:

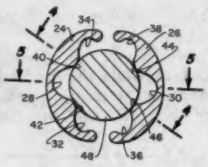
a first member;

a second member, said first and second members being pivotally connected together forming a scissors assembly, said first and second members being substantially of the same length, each said member having a fore end and an

aft end, manual grasping means formed on the said aft end of said members, said fore end of said members including first means for clamping onto a Laminaria tent, said first means comprising:

said fore end of said first member being recessed into a first recess assembly;

said fore end of said second member being recessed into a second recess assembly, said first and second recess assemblies cooperating to clamp onto a Laminaria tent, the cross-sectional configuration of said first recess assembly being a mirror image of said second recess assembly, each said recess assembly including a plurality of side-by-side elongated grooves separated by elongated upstanding walls, the longitudinal dimensions of each said groove



being substantially along the longitudinal dimension of its respective said first or second member, whereby the forceps may be universally used to clamp onto different diameters of Laminaria tents and thereby facilitate insertion of the Laminaria tent into the desired position within the uterine cervix; and

each said recess assembly including a single enlarged elongated groove centered in accordance with the width dimension of its respective said fore end, each said recess assembly further including a single elongated side groove located on each side of said enlarged groove, said enlarged groove being of a larger size than said side grooves, said upstanding side walls of said enlarged elongated groove to be in physical contact with the smaller diametered Laminaria tent.

4,192,314

SURGICAL INSTRUMENTS

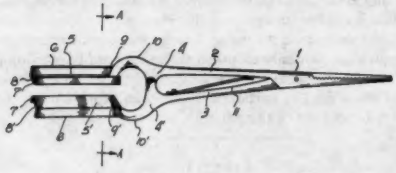
Pedro D. Curutchet, Sarmiento 156, Loberia, Provincia de Buenos Aires, Argentina

Filed Oct. 26, 1977, Ser. No. 845,768

Claims priority, application Argentina, Oct. 27, 1976, 265253

Int. Cl.[2] A61B *17/28*

U.S. Cl. 128—322 **8 Claims**



1. A surgical instrument, comprising two elongate members which are pivoted together intermediate their ends in crossing relationship, so as to define a major plane of the instrument extending substantially perpendicular to the axis of pivotal movement of the members and in which the members move during relative pivotal movement thereof, each member having at one end an operating portion which cooperates with the operating portion of the other member when the two operating portions are brought together by relative pivotal movement of the two members, and each member having at its opposite end an actuating key which can be urged towards the actuating key of the other member for bringing the operating portions into cooperating disposition, each actuating key comprising a plate which extends transversely to the major plane of the instrument whereby force can be applied to urge the actuating keys together, and each of said plates including a major portion of substantially rectangular form, having two opposite edges which extend substantially parallel to said major plane and two wing portions extending along said opposite edges respectively defining the length of the wing portions and directed away from the other plate defining the width of the wing portions, and wherein that wing portion of one plate which is on one side of the major plane is greater in width than the wing portion of said one plate that is the other side of the major plane, and that wing portion of the other plate which is on said other side of the major plane is greater in width than the wing portion of said other plate that is on said one side of the major plane.

4,192,315

CLIP FOR SURGICAL PURPOSES

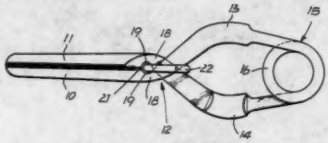
Fritz Hilzinger, Emmingen, and Theodor Schwarz, Tuttlingen, both of Fed. Rep. of Germany, assignors to Aesculap-Werke Aktiengesellschaft vormals Jetter & Scheerer, Tullingen, Fed. Rep. of Germany

Filed Dec. 16, 1977, Ser. No. 861,347

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658478

Int. Cl.[2] A61B *17/12*

U.S. Cl. 128—346 **1 Claim**



1. A vascular clip having open and closed positions comprising:

two jaws having pinching surfaces;

a coil spring for pressing said pinching surfaces together when the clip is in its closed position;

said coil spring including two legs and at least one coil loop resiliently connecting said legs;

said legs crossing over each other at a crossing point and having end portions immediately adjoining said crossing point;

said jaws being formed by said end portions;

recess means, notched on the inside of each of said end portions, for forming an intermediate space which separates said pinching surfaces from said crossing point in the closed position of said clip; and

a ring slidable along and encircling said legs at said crossing point which extends through said intermediate space.

4,192,316

PROGRAMMABLE ATRIO-VENTRICULAR PACER

Robert A. Walters, Murrysville; William L. Johnson, Kittanning, and Gary W. Bivins, Pittsburgh, all of Pa., assignors to ARCO Medical Products Company, Leechburg, Pa.

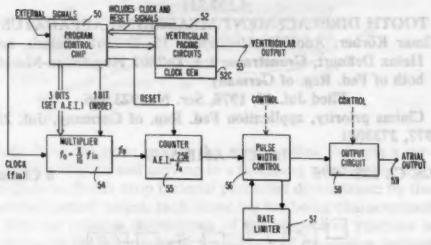
Filed May 22, 1978, Ser. No. 908,296

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **3 Claims**

1. Programmable digital pacer apparatus for providing and delivering synchronized atrial and ventricular stimulus pulses to a patient's heart, said apparatus comprising a ventricular pacing circuit comprising demand generator means for producing ventricular stimulus pulses in the absence of natural heartbeats, and an atrial pacing circuit for generating and delivering atrial stimulus pulses in the absence of natural heartbeats, said ventricular pacing circuit and atrial pacing circuit

being synchronized in their timing, said pacer being characterized by having digital programming means for receiving external parameter control signals and generating a plural bit binary word therefrom, ventricular control means for deriving ventricular control signals from a predetermined number of the bits of said word and controlling predetermined parameters of said ventricular pacing means therewith, and atrial control means for deriving atrial control signals from a second predetermined portion of said binary word and controlling predetermined operating parameters of said atrial pacing means therewith, said pacer further comprising a clock generator connected to deliver clock signals to said ventricular pacing circuit and to said atrial pacing circuit, said ventricular pacing



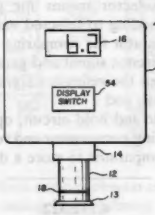
circuit having means for determining the rate of said ventricular stimulus pulses as a function of both said clock signals and said ventricular control signals and said atrial pacing circuit having means for determining the rate of said atrial stimulus pulses as a function of both said clock pulses and said atrial control signals, said atrial pacing circuit further comprising atrial escape interval means adapted to provide a timing signal for timing the generation of said atrial stimulus pulses, and means for resetting said atrial escape interval means in synchronization with the operation of said ventricular pacing circuit, said atrial escape interval means being characterized by having circuitry which disables its operation following delivery of an atrial stimulus pulse until it is reset by a synchronizing signal from said ventircular pacing circuit.

4,192,317

INDENTATION TONOMETER

Charles R. Munnerlyn, Sunnyvale, and Terrance N. Clapham, San Jose, both of Calif., assignors to Ical, Incorporated, Sunnyvale, Calif.

Filed Jun. 30, 1978, Ser. No. 920,806
Int. Cl.[2] A61B 3/16
U.S. Cl. 128—646 **12 Claims**



1. An indentation tonometer having a foot plate and a plunger movable relative to said foot plate, said tonometer comprising:

a. a housing that is hand holdable and manipulatable;

b. means in said housing for supporting said foot plate to extend below said housing;

c. an optical encoder disposed within said housing and having a ruled scale that is fixed relative to said foot plate and an adjacent ruled scale that is movable relative to said fixed scale;

d. an upper surface of said plunger engaging said movable scale for elevating said movable scale relative to said fixed scale to correspond to the position of said plunger relative to said foot plate as the intraocular pressure of an eye is measured; and

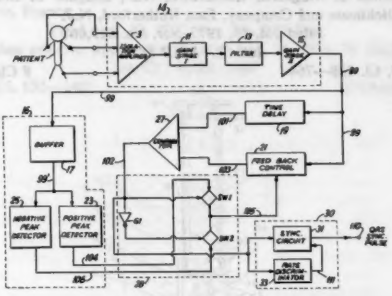
e. components for said optical encoder including electric power supply, electric circuitry, and digital readout all being arranged in said housing for digitally indicating a measure of said intraocular pressure derived from the position of said movable scale relative to said fixed scale.

4,192,318

METHOD AND APPARATUS FOR LOCATING THE QRS PORTION OF AN ELECTROCARDIOGRAPHIC SIGNAL

Naim G. Dam, Bayside, and Monroe A. Landau, Kew Gardens, both of N.Y., assignors to Bios Inc., Valhalla, N.Y.

Filed Sep. 13, 1978, Ser. No. 942,063
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—708 **28 Claims**



5. Apparatus for automatically detecting the QRS portion of an electrocardiographic signal comprising:

(a) means for adapting a terminal to receive said electrocardiographic signal;

(b) means for providing a time delayed replica of said electrocardiographic signal;

(c) means for biasing a first one of said electrocardiographic signal and said time delayed electrocardiographic signal; and

(d) means for comparing said biased electrocardiographic signal and the second one of said electrocardiographic signal and said time delayed electrocardiographic signal to provide a synchronization signal at the crossover point of said signals being compared.

4,192,319

WICK CATHETER PRESSURE SENSING PROBE AND METHOD OF USE

Alan R. Hargens, and Scott J. Mubarak, both of San Diego, Calif., assignors to Regents of University of California, Berkeley, Calif.

Filed Sep. 30, 1977, Ser. No. 838,187
Int. Cl.[2] A61B 5/02; A61M 5/00
U.S. Cl. 128—748 **7 Claims**

5. A catheter unit for placement and measuring of interstitial pressures comprising:

a catheter tube;

an adapter on one end of said tube;

a wick partially drawn into the other end of said tube;

a monofilament tether having one end fixedly secured to said wick, said tether extending through said tube with the other end of said tether adjacent to said one end of said tube;

said tube being filled with a sterilized heparinized solution; and

pressure-sensing and indicating means connected to said adapter whereby interstitial pressure may be measured after insertion of the catheter tube and wick to the desired placement within the body tissue.

4,192,320

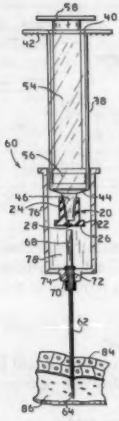
ADAPTER FOR SYRINGE

Shenoda S. Megahed, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jul. 28, 1977, Ser. No. 819,667

Int. Cl.[2] A61B *5/14*

U.S. Cl. 128—764 **8 Claims**



1. A syringe assembly comprising: a syringe with a reduced diameter open-ended tip for use with a blood collecting needle so as to facilitate coupling of the syringe and needle and collecting of a sample of blood through the needle into the syringe, an adapter including an elastomeric, pierceable, self-sealing member having a head portion and a body portion extending from one side of the head portion, a recess in the body portion conforming with the shape of the reduced tip of the syringe and adapted to be removably mounted on the tip and close the open end thereof, the recess having a slightly smaller diameter in relaxed condition than the reduced tip of the syringe along their conforming interengaging surfaces thereby facilitating frictional interengagement therebetween and mounting of the adapter on the syringe and to provide for removal of the adapter to permit subsampling from the syringe to be carried out, guide means on the head portion to assist in guiding the needle into alignment with the open end of the tip so that when the needle pierces the head portion it will extend through the open end of the tip into communication with the interior of the syringe to permit collection of a blood sample therein, the self-sealing head portion adapted to reseal and remain mounted on the syringe and close the open end of the reduced tip after the needle is removed therefrom, the needle being in the form of a double ended hollow cannula with one end adapted for venipuncture and the other end adapted for puncturing the adapter and communicating with the interior of the syringe, a hub mounted intermediate the ends of the double ended cannula and having means thereon for mounting the hub to one end of a hollow holder with the end of the cannula to be introduced to the syringe extending into the holder and the end for venipuncture extending out of the holder, and the hollow holder being open at the end opposite to the end where the cannula is mounted to permit reciprocal introduction and removal of the syringe therein with the adapter mounted thereon for interengagement and removal from the cannula.

4,192,321

TOOTH DISPLACEMENT MEASURING APPARATUS

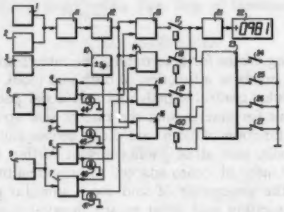
Elmar Körber, Adolf-Bechlerstrasse 15, D-7501 Malsch, and Heinz Dehnert, Grunstrasse 1 a, D-7801 Hugstetten-March, both of Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 923,866

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733081

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—776 **8 Claims**



1. In a tooth displacement measuring apparatus of a type wherein a force transmitting member applies force to a test tooth and at least one displacement member abuts a reference surface to define a zero force reference position to measure the relative displacement of said displacement member from said force transmitting member in response to said force, the improvement comprising:

force measuring means for generating an applied force signal corresponding to the force applied by said force transmitting member to said test tooth;

displacement measuring means for generating a displacement signal corresponding to the relative displacement between said force transmitting member and at least one displacement member;

reference force selector means for generating reference signals corresponding to selected values of force;

at least one comparator for comparing said applied force to at least one reference signal and generating an associated hold signal when the reference signal is equal to the applied force signal; and

at least one sample and hold circuit, operatively connected to a corresponding comparator and responsive to the hold signal of the comparator to store a displacement signal.

4,192,322

AXIAL FLOW SEPARATOR WITH STEPPED THRESHING BAR ROTOR

John E. Wilson, Colona, Ill., assignor to Deere & Company, Moline, Ill.

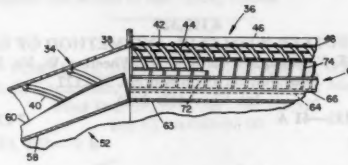
Filed May 1, 1978, Ser. No. 901,326

Int. Cl.[2] A01F *12/18*

U.S. Cl. 130—27 T **12 Claims**

1. In a combine having an axial flow rotary separator for processing crop material and means for delivering crop material from a field to the separator, the separator including a

generally cylindrical threshing housing having an upstream inlet and a threshing grate and including a threshing rotor having a frame and supported for rotation within the housing, the separator also including material control means for propelling crop material received from the field downstream through the threshing housing inlet and within the threshing housing as the rotor rotates, the rotor including at least two circumferentially spaced generally longitudinally extending elongated threshing bars carried by the frame, each bar having an upstream portion adjacent the threshing housing inlet and a downstream portion, each portion being spaced radially in-



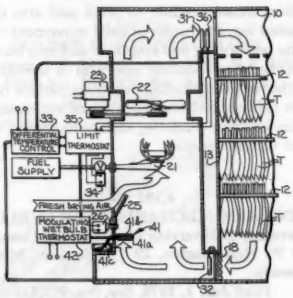
wards from the grate and, as the rotor rotates, defining a surface of revolution and moving in a threshing relationship with the grate to thresh crop material propelled downstream by the material control means, each threshing bar being characterized in that the relative dispositions of the respective portions is such that as the rotor rotates, the surface of revolution defined by the upstream portion is substantially cylindrical and of smaller diameter than that defined by the downstream portion, the relatively greater clearance between rotor and grate adjacent the inlet facilitating propulsion of material into the threshing housing.

4,192,323

APPARATUS AND METHOD FOR AUTOMATICALLY CONTROLLING CURING CONDITIONS IN A TOBACCO CURING BARN

William P. Horne, Charlotte, N.C., assignor to Gas-Fired Products, Inc., Charlotte, N.C.

Filed Sep. 21, 1977, Ser. No. 835,232
Int. Cl.[2] A24B *3/04, 3/12*
U.S. Cl. 131—135 **14 Claims**



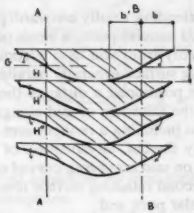
1. An apparatus for bulk curing tobacco comprising a curing barn, means in said curing barn defining a tobacco curing chamber adapted for receiving tobacco leaves for curing and including an inlet and outlet for the flow of air in and out of the curing chamber, means defining an air passageway communicating with the inlet and outlet of the curing chamber for directing air in a recirculating flow into and through the curing chamber, a fan cooperating with said air passageway for inducing a forced flow of air therealong and through the curing chamber and into contact with the tobacco leaves disposed in the curing chamber, a heater cooperating with said air passageway for heating the air flowing along the air passageway and through the curing chamber, first and second dry bulb temperature sensing means located in the path of air flow respectively adjacent the inlet and outlet of the curing chamber for sensing the differential in temperature of the air upon entering and leaving the curing chamber, which temperature differential is a function of the rate of drying of the tobacco within the curing chamber, and differential temperature control means operably associated with said heater and responsive to said first and second temperature sensing means for controlling the rate of drying of the tobacco by controlling the operation of the heater to vary the temperature of the air entering the curing chamber so as to maintain a predetermined differential in dry bulb temperature between the first and second temperature sensing means and thus provide an optimum rate of drying for tobacco of varying drying characteristics.

4,192,324

PROCESS FOR CONSTITUTING A LARGE SURFACE OF NATURAL TOBACCO, IN PARTICULAR FOR MAKING CIGAR WRAPPERS

Jacques Paret, Fleury-les-Aubrais, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Aug. 17, 1977, Ser. No. 825,383
Claims priority, application France, Aug. 18, 1976, 76 25029
Int. Cl.[2] A24B *3/00*
U.S. Cl. 131—149 **13 Claims**



1. A process for constituting a large surface of natural tobacco, in particular for making cigar wrappers comprising the steps of:

(a) stripping the biggest rib of natural tobacco leaves;

(b) dividing each leaf into two half-leaves;

(c) arranging the half-leaves in a plane in succession along a continuous row in such a manner that the rectilineal side of each half-leaf corresponding to the removed rib is orientated in a fixed direction, transverse to the longitudinal of the formed continuous row, that said half-leaves are adjoining each other, that the remaining ribs are in relief on the same side of the plane and have the same orientation;

(d) covering with tobacco fragments the areas between the half-leaves where the tobacco is missing;

(e) maintaining all the leaf fragments in their respective arrangement.

4,192,325

HAIR STYLING APPLIANCE INCLUDING IMPROVED BAYONET FASTENERS FOR ASSEMBLING SAME

Ronald R. Liedtke, Addison, Ill., assignor to Schick Incorporated, Lancaster, Pa.

Filed Jan. 10, 1978, Ser. No. 868,403
Int. Cl.[2] A45D *20/00*
U.S. Cl. 132—9 **12 Claims**

1. In a hair styling appliance for applying a hot air stream to hair, said appliance being of the type including a housing having a generally annular air outlet port and a styling attachment including a generally annular air inlet port adapted for releasible mounting on said outlet port;

the improvement comprising:

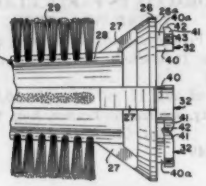
a plurality of first bayonet mounting members positioned in substantially equally spaced angular relation around one of said annular ports, and

a like number of second bayonet mounting members which are matingly engageable with said first members and positioned in substantially equally spaced angular relation around the other of said annular ports;

each of said first bayonet mounting members including

an elongate first detent extending radially inwardly of an inner circumference of said one annular port along an arcuate segment thereof, said detent defining a substantially flat elongate first retaining surface positioned in a plane perpendicular to the axis of said port and the distance between the plane of said first retaining surface and the plane of said one port defining the operative thickness of said detent;

each of said second bayonet mounting members including



a base portion extending axially outwardly of the plane of the other of said annular ports, a block portion extending radially outwardly from said base portion and defining a second retaining surface generally parallel to the plane of said other port positioned a distance therefrom substantially equal to the thickness of said elongate detent;

said block portion including a resilient arm extending arcuately outwardly thereof, an extension of said second retaining surface on said arm being curved outwardly of the plane of said second retaining surface toward the plane of said other annular port; and

the engagement of said first and second bayonet members by rotatingly inserting said elongate detent on said one annular port between said other annular port and said second retaining surface on said block portion biasing said resilient arm against said elongate first detent first retaining surface, whereby a secure rattle-free engagement is accomplished between said housing and said styling attachment.

4,192,326

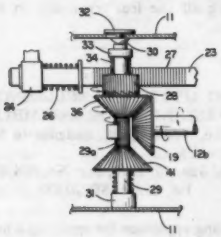
HAIR STYLING IMPLEMENT

Gerald E. Klinge, 5637 Dunk Dr., Indianapolis, Ind. 46224

Filed Jun. 28, 1978, Ser. No. 920,132

Int. Cl.[2] A45D 2/12

U.S. Cl. 132—34 R **7 Claims**



1. A hair styling implement comprising a tubular housing forming a handle and an elongated member extending coaxially from the housing adapted to removably accomodate a styling attachment, said elongated member having a portion extending into said housing and being supported therein for rotation about its longitudinal axis with relation to the housing, a rectilinearly moveable abutment extending from a longitudinal slot in said housing and adapted for finger induced motion within the slot by an operator grasping said handle, motion transmission means within said housing operatively connecting said abutment and the portion of the elongated member within the housing for transforming the rectilinear motion of said abutment into rotary motion of said elongated member.

4,192,327

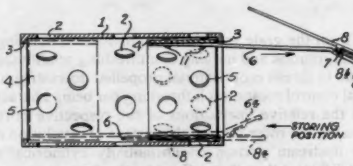
HAIR ROLLER WITH CLIP, AND METHOD OF USE

Anthony E. Vasiliou, 241 Cardinal St., Wheeling, W. Va. 26003

Filed Jul. 14, 1976, Ser. No. 705,127

Int. Cl.[2] A45D 2/26

U.S. Cl. 132—41 A **7 Claims**



1. A hair rolling and holding device, for use in curling the hair, comprising in combination:

(i) a hollow cylindrical roller having air aperatures therethrough and open at both ends, capable of receiving strands of hair wound externally about it,

(ii) a clip to engage with and retain strands of hair wound about said roller, said clip including:

(a) a tubular slider having aperatures therethrough, slideably mounted on the interior wall of said roller for movement axially of said roller between a first end position of movement and a second end position of movement,

(b) an elongated leg extending axially from said slider,

(c) an arm being pivotally mounted on said elongated leg remote from said slider and extending axially towards said slider, and

(d) resilient means tending to pivot said arm towards said elongated leg, the extent of axial movement of said slider and the positioning and length of said arm being such that in said first end position said arm is withdrawn axially from the region of the hair-receiving surface of said roller, and in said second end position of movement said arm overlies said hair-receiving surface to engage with strands of hair wound thereon.

4,192,328

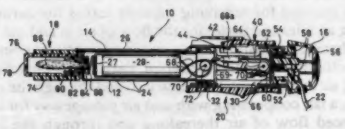
CLAMPING ARM MECHANISM FOR CURLING IRON

George Barradas, 15 Riverview Ct., Glenville, Conn. 06830, and Michael W. Hetherington, 29 Pringle Ave., Markham, Ontario, Canada

Filed Jun. 1, 1978, Ser. No. 911,521

Int. Cl.[2] A45D 2/24

U.S. Cl. 132—37 R **8 Claims**



1. A curling iron having a generally cylindrical barrel, an electrical heating element within said barrel, and an electrical

supply cord therefor, and wherein the improvement comprises:

a hair-clamping arm pivotally mounted on said barrel for movement between an elevated position in which it projects angularly and forwardly relative to said barrel and a lowered position in which it is disposed alongside said barrel in close proximity thereto;

a spring means acting on said hair-clamping arm and urging that arm into said lowered position thereof; and

a manually operable arm-lifting sleeve extending around said barrel and movable relative thereto to move said hair-clamping arm toward said elevated position thereof against the action of said spring means.

4,192,329

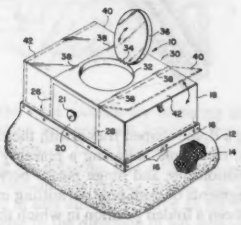
PORTABLE DRESSING TABLE OR VANITY

Gloria K. Swearingen, 1805 B Stanford, Columbia, Mo. 65201

Filed Dec. 29, 1977, Ser. No. 865,519

Int. Cl.[2] A45D *40/00*

U.S. Cl. 132—79 R **4 Claims**



1. A portable, organizational dressing table or vanity comprising an inelastic deformable base member, said member being adapted for support on the lap, knees or on a table surface and able to conform to the contour of said surface; a small article holder secured on said base; said holder including a central compartment flanked by storage bins, said compartment having a top provided with a cavity; a mirror hinged adjacent said cavity and adapted to be received therein; a drawer slidable in said compartment; and lids hinged on said top for closing said bins.

4,192,330

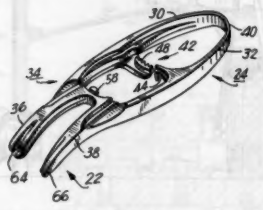
HOLDER FOR DENTAL FLOSS

Gary D. Johnson, 2 E. 82nd St., New York, N.Y. 10028

Filed Jan. 13, 1978, Ser. No. 869,176

Int. Cl.[2] A61C *15/00*

U.S. Cl. 132—91 **7 Claims**



1. A holder for dental floss comprising an oblong handle, said handle having two spaced apart resilient substantially parallel legs, said legs depending from a junction at one end of said handle, said one end of said handle having a bifurcated extension beyond said junction, adjustable means to engage portions of said two legs with each other said adjustable means including at least one pair of opposed tongues, each of said tongues extending inwards towards each other from a leg of the handle and each being substantially perpendicular to its respective leg, at least one of said tongues being provided with serrations, so that said tongues engagingly cooperate with each other to hold the legs toward each other, and thereby to spread apart the arms when the legs are moved towards each other and means mountable on said bifurcated one end of said handle, said mountable means including a length of dental floss.

4,192,331

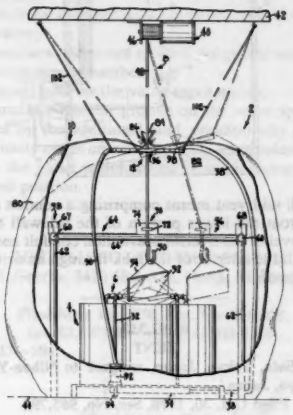
ELECTROPLATING APPARATUS

Dale, J. Koering, 1697 Laurel Ave., Saint Paul, Minn. 55104

Filed Aug. 28, 1978, Ser. No. 937,060

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—77 **20 Claims**



18. An improved apparatus for electroplating a plurality of articles, which comprises:

(a) an array of treating tanks at least one of which is a rinse tank;

(b) means for heating at least some of the treating tanks;

(c) means for shower rinsing articles contained in the rinse tank with a cleaning fluid;

(d) means for moving the articles between the treating tanks; and

(e) means for conserving waste heat given off by the heating tanks during an electroplating operation, the conserving means being located in a heat exchange relationship with a cleaning fluid supply line for the rinsing means, whereby the cleaning fluid sprayed thereby will be heated.

4,192,332

VERTICAL LIQUID STORAGE TANK AND APPARATUS FOR CLEANING

Robert H. Feldmeier, 7632 Hunt La., Fayetteville, N.Y. 13066

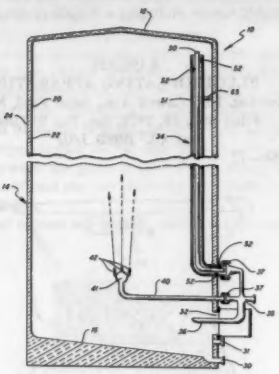
Continuation-in-part of Ser. No. 908,397, May 22, 1978, abandoned, and a continuation-in-part of Ser. No. 957,322, Nov. 2, 1978, and a continuation-in-part of Ser. No. 949,373, Oct. 6, 1978, and a continuation-in-part of Ser. No. 916,887, Jun. 19, 1978. This application Feb. 22, 1979, Ser. No. 14,231

Int. Cl.[2] B08B *3/02, 9/08*

U.S. Cl. 134—167 R **6 Claims**

1. A vertical tank of the silo-type for storage of liquids including a top, cylindrical sidewall, drainable bottom, and means for filling and draining said tank and also including cleaning means, vent means, and overfill prevention means; said cleaning means comprising an adjustable, upwardly directed spray nozzle for directing a spray of liquid onto the top of the tank, said nozzle positioned centrally with respect to the sidewall near the bottom of the tank on a conduit extending

through said wall in communication with said nozzle; said overfill prevention means comprising a conduit extending upwardly from the lower portion of the sidewall to a predetermined point above which the tank can not be filled and communicating with the interior of the tank through an orifice in

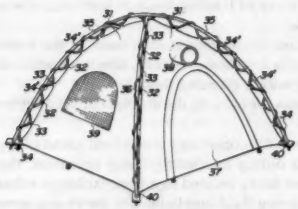


the sidewall; said vent means comprising a conduit extending upwardly from the lower portion of the sidewall to a point above the level of the overfill prevention conduit and communicating with the interior of the tank through an orifice in the sidewall thereof.

4,192,333
TENT

Tomoyoshi Sato, Tokyo, Japan, assignor to Nihon-Yohin Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1978, Ser. No. 955,794
Int. Cl.[2] A45F *1/12*
U.S. Cl. 135—3 E **8 Claims**



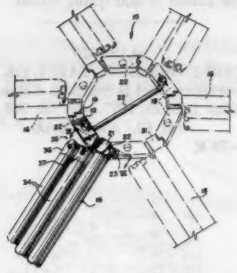
1. A structure of an outer type tent wherein a cord, tape or the like is mounted at intervals along a ridgeline of an outer pole type tent proper, or the like, loops are formed of the cord lying between the mounting portions, engaging portions such as hooks are disposed between said mounting portions, and said loops are engaged with said engaging portions astride the tent pole.

4,192,334
COLLAPSIBLE DOME FRAME

Lee F. Daws, Kingston, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed May 30, 1978, Ser. No. 910,853
Claims priority, application Canada, Jun. 30, 1977, 281802
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—4 R **9 Claims**

1. A collapsible dome-shaped frame for a tent or similar structure comprising a top ring having a plurality of pairs of sections, each pair of sections including a fixed section and a pivotal section rotatable relative to the fixed section; said top ring including shaft means extending between adjacent fixed sections to permit rotation of the pivotal sections intermediate said adjacent fixed sections, said pivotal sections being longitudinally movable on said shaft means between a first position where said pivotal sections are locked open, and a second position where the pivotal sections can be rotated relative to the fixed sections; and further including locking means on one end of each pivotal section and an adjacent end of a fixed section for locking the pivotal section in the open position; a pole fixedly connected to each pivotal section of the ring; the

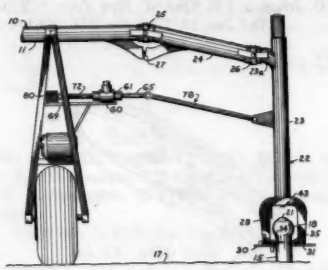


poles defining a dome-shaped frame with the ring when in the open position, each pole including a plurality of segments in end-to-end relationship; and hinge means between each adjacent pair of segments of each pole permitting movement of the segments between a folded position in which the poles define a generally barrel-shaped cage and the open position in which the outer surfaces of said top ring and hinge means are substantially continuous with the outer surface of said pole segments, whereby the frame is smooth and substantially free of projections.

4,192,335
GUIDANCE SYSTEM FOR IRRIGATION SPRINKLING APPARATUS

Norman S. Standal, Star Route, Bliss, Id. 83314

Filed Apr. 18, 1978, Ser. No. 897,637
Int. Cl.[2] B05B *3/18*
U.S. Cl. 137—1 **18 Claims**



14. A method of guiding a steerable mobile sprinkling apparatus along a path in a direction parallel to a plurality of spaced references, comprising the following steps:

transversely indexing the mobile sprinkling apparatus relative to each reference encountered along the path;

sensing the transverse distance between each encountered reference and a selected location on the mobile sprinkling apparatus when the mobile sprinkling apparatus is transversely indexed relative to it;

and steering the mobile sprinkling apparatus by a preset

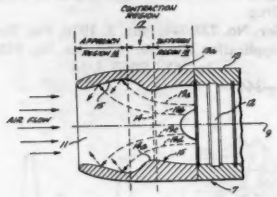
correction proportional to the sensed transverse distance to direct it toward or away from a path defined by the spaced references during subsequent movement of the mobile sprinkling apparatus between each encountered reference and the succeeding reference.

4,192,336

NOISE SUPPRESSION REFRACTING INLET FOR JET ENGINES

Bannister W. Farquhar, and Denis Sloan, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1975, Ser. No. 644,893
Int. Cl.[2] F01N *11/00*
U.S. Cl. 137—15.1 **15 Claims**



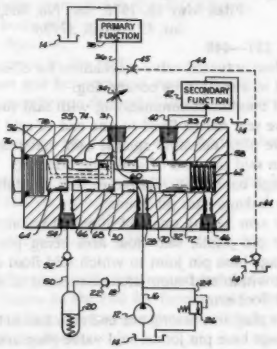
1. In an air inlet duct suitable for directing airflow to the inlet of a jet engine wherein said air inlet duct includes an entrance opening and a flow passage extending from said entrance opening for directing said airflow to said jet engine inlet, the improvement comprising means for establishing a velocity gradient in said airflow relative to the direction substantially transverse to the direction of aid airflow, said means for establishing said velocity gradient being located along a predetermined portion of said flow passage at a position downstream of said entrance opening, said velocity gradient being characterized in that sound waves traveling through said flow passage of said duct in a direction opposed to the direction of said airflow are refracted by an amount sufficient to impinge said sound waves on said means for establishing said velocity gradient.

4,192,337

PRIORITY FLOW VALVE

Loren L. Alderson, Nickerson, Kans., and Delbert E. Truesdell, Conover, Ohio, assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Aug. 7, 1978, Ser. No. 931,701
Int. Cl.[2] G05D *11/02*
U.S. Cl. 137—101 **5 Claims**



1. An improved priority flow valve of the type used between a fluid power source and functions operated by the source, one of the functions being a priority function connected to the valve through a restriction and at least one other function being a secondary function connected to the valve; the valve having a bore, an inlet chamber connected to the fluid power source, a priority outlet chamber connected to the priority function, a secondary outlet chamber connected to the secondary function; the bore passing through these inlet, priority outlet, and secondary outlet chambers; valve spool means, slidably positioned in the bore by a control servo with opposing chambers, for sensing pressures upstream and downstream from the restriction, a land near each end of the valve spool means, an annular groove located between the two lands and conditionally connecting the inlet chamber with the priority and secondary outlet chambers, and spring means for urging the valve spool means in one direction; wherein the improvement comprises:

an accumulator chamber adjacent to the bore in the priority flow valve;

an accumulator connected to the fluid power source and to the accumulator chamber;

an additional land on the valve spool means;

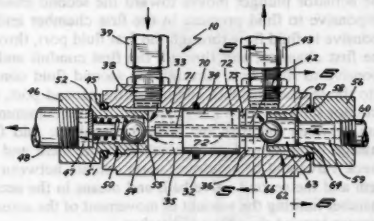
an accumulator annular groove on the valve spool means, formed by the additional land, conditionally connecting the priority outlet chamber with the accumulator chamber when the valve spool means is in an extreme priority demand position.

4,192,338

HYDRAULIC LOCK-OUT DEVICE

Benedict R. Gerulis, 3420 48th Ave. North, Minneapolis, Minn. 55429

Filed May 15, 1978, Ser. No. 906,008
Int. Cl.[2] F15B *13/042;* G05D *7/00*
U.S. Cl. 137—106 **3 Claims**



1. A lock-out device for use with a hydraulic motor of the type having a hydraulic cylinder and a piston and rod assembly reciprocally movable in the hydraulic cylinder from a first end of the hydraulic cylinder toward a second end of the hydraulic cylinder during a working stroke, and from the second end of the hydraulic cylinder toward the first end of the hydraulic cylinder during the return stroke, said device including:

a housing having a first chamber and a second chamber;

a first fluid port open to the first chamber for ingress and egress of fluid from a fluid supply;

a first fluid conduit connected to the first chamber;

a check valve located in the first chamber oriented with respect to the first fluid conduit to permit passage of fluid under pressure from the first chamber through the first conduit and means for maintaining the check valve normally biased in a closed configuration to prohibit movement of fluid through the first fluid conduit back to the first chamber;

a second fluid port open to the second chamber for ingress and egress of fluid to the second chamber from a fluid supply;

a second fluid conduit connected to the second chamber;

a second valve located in the second chamber positioned with respect to the second fluid conduit movable to a first position to permit free flow of fluid through the second

fluid conduit into the second chamber and a second position to permit restricted flow of fluid through the second chamber and through the second conduit, said second valve including a valve stop associated with the passageway of the second fluid conduit into the second chamber, a second valve ball located in the second chamber movable to a position away from the valve stop to permit free fluid flow, and movable into position of seated relationship with the valve stop, said second valve stop shaped to permit restricted fluid flow past the second ball from the second chamber to the second fluid conduit when the second valve ball is seated therein; and

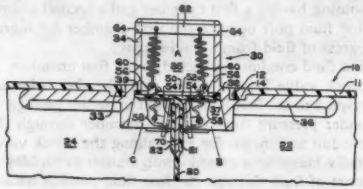
means responsive to pressure in the second chamber operable to open the check valve in the first chamber when fluid pressure is applied through the second port, through the second chamber, and through the second conduit to the second end of the cylinder, said means to open the check valve including an actuator plunger disposed in the housing between the first and second chambers movable in one direction toward the first chamber responsive to fluid pressure in the second chamber, and movable in the opposite direction toward the second chamber responsive to fluid pressure in the first chamber, and means on said actuator plunger to contact the check valve to open the check valve as the actuator plunger is moved toward the first chamber; and the means on the actuator plunger to contact the check valve including an actuator stem having one end extending toward the first chamber and another end extending toward the second chamber, the end extending toward the first chamber adapted to contact said check valve to open the check valve upon movement of the actuator plunger toward the first chamber responsive to pressure in the second chamber, said end of the actuator stem extending toward the second chamber adapted to contact the second valve ball in the second chamber when the actuator plunger moves toward the second chamber responsive to fluid pressure in the first chamber and responsive to fluid flow through the first fluid port, through the first chamber, and through the first conduit and responsive to fluid flow through the second fluid conduit into the second chamber and out of the second port, said actuator stem having a fluid passage for fluid communication between the first and second chambers, said fluid passage being closed on contact with the stem and the check valve and being closed upon contact between the stem and the second valve ball, and means in the second chamber limiting the amount of movement of the actuator plunger toward the second chamber.

4,192,339

VALVE ASSEMBLY

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 11, 1978, Ser. No. 941,838
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—223 **7 Claims**



1. A valve assembly at the inlet to a fluid chamber which chamber comprises a pair of fluidly independent subchambers separated by a flexible impervious wall member, said assembly comprising:

(A) a valve housing including

(1) an upstream fluid conduit portion having a valve seat adjacent its downstream end, and (2) a downstream annular flange portion having a central opening coaxial with said conduit portion and means to secure said housing at said inlet; and

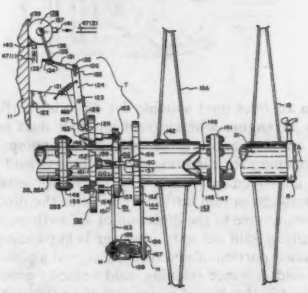
(B) a valve member disposed within said housing between said conduit portion and said flange portion, said valve member comprising a pair of movable portions pivotable about a common axis each of said movable portions communicating said conduit portion with one of said subchambers.

4,192,340

AGRICULTURAL IRRIGATION SYSTEM AND COMPONENTS THEREFOR

Burr Courtright, La Grande, Oreg., assignor to CH_2O, Inc., La Grande, Oreg.

Division of Ser. No. 738,044, Nov. 2, 1976, Pat. No. 4,151,858.
This application Dec. 28, 1978, Ser. No. 973,893
Int. Cl.[2] B05B *3/18*
U.S. Cl. 137—344 **14 Claims**



1. An agricultural irrigation structure having a rotating member and power control means, and in combination therewith, a ground contacting wheel carried by said structure and having a central axis of revolvement, and means revolvable about said central axis, coupled to and between said rotating member and said wheel, and responsive to divergence of relative rotational movement between said rotating member and said wheel for automatically adjusting said control means.

4,192,341

DRAIN TRAP VALVE MECHANISM

Milton Hilmer, Quakertown, Pa., assignor to Sarco Company, Inc., Quakertown, Pa.

Filed May 18, 1978, Ser. No. 906,930
Int. Cl.[2] F16K *31/26*
U.S. Cl. 137—445 **5 Claims**

1. A float actuated valve mechanism for controlling the level of liquid in a sump area comprising:

a fluid conduit communicating with said sump area;

a valve seat means fixed to one end of said fluid conduit;

a valve plug movable against said valve seat to close and open said one end of said fluid conduit;

a linkage base fixed relative to said conduit and providing two linkage base pin joints;

a float arm having one end attached to one of said linkage base pin joints, said float arm being pivotal about said linkage base pin joint to which said float arm is attached;

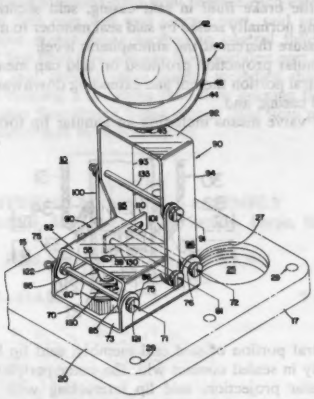
a float within said sump area connected to the other end of said float arm;

a valve plug arm having one end attached to the other of said linkage base pin joints, said valve plug arm being pivoted about said linkage base pin joints to which said valve plug arm is attached, said valve plug being mounted on said valve plug arm;

a float arm pin joint provided by said float arm;

a valve plug arm pin joint provided by said valve plug arm; and

a connecting arm means extending between and pivotal about said float arm pin joint and said valve plug arm pin



joint, said linkage base and said arms constituting a four-bar linkage providing a non-linearly varying mechanical advantage between said float and said valve plug, said arms, said float and said valve plug being movable in a generally common plane.

4,192,342

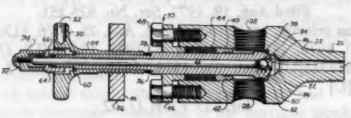
ROD OUT VALVE

Donald L. Adams, P.O. Box T, Tulia, Tex. 79088

Filed Feb. 16, 1978, Ser. No. 878,617

Int. Cl.² G01F *15/12*; B08B *9/02*; F16K *31/46*

U.S. Cl. 137—245.5 **1 Claim**



1. In a station for testing fluid in a conduit including

a. a duct extending into the conduit,

b. a valve fluidly connected to the duct having

(i) a valve body with

(ii) a fluid chamber,

(iii) a valve stem in the body,

(iv) a bonnet seal between said stem and body,

(v) a valve member on the end of the stem in the chamber, and

(vi) a valve seat on the body between the chamber and the duct;

the improved structure for cleaning debris from the duct comprising in combination with the above:

c. said valve stem being hollow,

d. a cleaning rod telescoped within said valve stem and valve member,

e. a stem seal between said cleaning rod and said valve stem,

f. extension means on the rod for forcing said cleaning rod into and said duct thereby pushing any debris within the duct out of the duct,

g. a valve seat on the valve stem,

h. a stem valve on the rod adapted to engage said stem valve seat, whereby the rod is sealed to the stem when the rod is fully telescoped within the stem,

j. a retaining ring on the valve stem which contacts the stem valve to hold the rod fully telescoped,

k. a bonnet seat around the valve stem threaded into the body with tapered threads between the chamber and the bonnet seal, whereby said valve member may be seated on said bonnet valve seat and the bonnet seal removed without leakage of fluid from the chamber,

l. a valve handle journalled around the valve stem and having a circular periphery threaded to said valve body,

m. radial holes through the outer periphery of the handle, whereby a pin may be inserted in one of said radial holes to obtain leverage in turning the handle,

n. diametrically opposed threaded outlet ports in valve body from the chamber,

o. a plug in one outlet port, and

p. a fluid conduit in the other port.

4,192,343

FULL-FLOW RELIEF VALVE

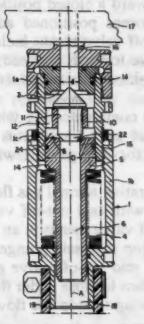
Mirko Grahač, Kamp-Lintfort, Fed. Rep. of Germany, assignor to WOMA-Apparatebau Wolfgang Maasberg & Co., GmbH, Duisburg, Fed. Rep. of Germany

Filed Nov. 6, 1978, Ser. No. 957,846

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2749812

Int. Cl.² F16K *17/20*

U.S. Cl. 137—474 **10 Claims**



1. A valve comprising:

a housing having an inlet port forming an inlet valve seat, an outlet port, a valve chamber between said ports, and an abutment in said chamber;

a valve body in said chamber having an inlet end engageable in said inlet valve seat and an outlet end, said body being displaceable in said housing between a closed position with its said inlet end seated in and blocking said inlet valve seat and an open position engaging said abutment and with its said inlet end spaced from said inlet valve seat;

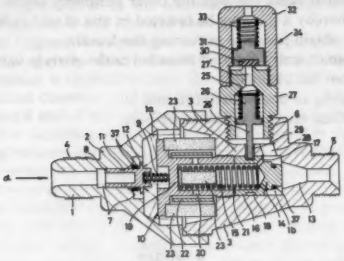
a pilot piston in said chamber having a throughgoing passage opening at one end at said outlet port and forming at its opposite end an outlet valve seat engageable with said outlet end of said valve body, said piston being displaceable in said housing between an open position with its said outlet valve seat spaced from said outlet end of said valve body in either position thereof and a closed position with its said outlet valve seat engaging and blocked by said outlet end; and

biasing means in said housing urging said piston into said closed position.

4,192,344
AUTOMATIC EMERGENCY STOP APPARATUS AGAINST COUNTER FLOW AND COUNTER FIRE OF GAS BODIES

Yoshiaki Masuya, and Terumasa Masuya, both of 2-8, Takaida Higashi, Higashi Osaka City, Osaka, Japan

Filed Oct. 31, 1978, Ser. No. 956,337
Claims priority, application Japan, Nov. 5, 1977, 52-133246
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—489.3 6 Claims



1. An automatic emergency stop apparatus for protecting against the dangers of counter flow and counter fire of gas comprising:

a hollow valve body including a gas flow inlet and gas flow outlet;

a check valve means positioned adjacent said gas flow inlet said check valve means including a spring biasing said check valve toward a closed position;

a cut-off valve means positioned adjacent said gas flow outlet said cut-off valve means including a spring biasing said cut-off valve towards a closed position;

a filter means positioned between said check and cut off valve means;

a safety apparatus communicating with the interior of said valve body, said safety apparatus including a plunger means adapted for engagement with said cut-off valve means;

wherein in an operative normal gas flow state, said plunger means engages with said cut-off valve means and maintains said cut-off valve means in an open position, and in an emergency stop state said plunger means is moved out of contact with said cut-off valve means permitting said cut-off valve means to close under the force of said cut-off valve biasing spring to stop the flow of gas.

4,192,345
SEALED TYPE HYDRAULIC RESERVOIR

Takashi Fujii, Toyota; Atsushi Ohmi, Anjo; Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 10, 1977, Ser. No. 850,484
Claims priority, application Japan, Nov. 11, 1976, 51-135647
Int. Cl.[2] F15B *7/10*
U.S. Cl. 137—572 6 Claims

1. A sealed type hydraulic reservoir comprising:

a casing having an upper open end for storing brake fluid therein to be supplied to a hydraulic brake master cylinder;

a cap member detachably mounted on the open upper end of said casing;

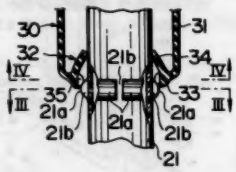
an elastic seal member, the outer peripheral portion thereof being secured to said cap member for sealing the brake fluid stored in said casing, said seal member being movable between upper and lower predetermined positions;

a first chamber within said reservoir and defined between the under side of said cap member and the upper side of said seal member, said first chamber being in communication with the atmosphere through a vent hole provided in said cap member;

a second chamber within said reservoir and defined between the under side of said seal member and the liquid surface of the brake fluid in said casing, said second chamber being normally sealed by said seal member to maintain the pressure therein at the atmospheric level;

an annular projection provided on said cap member at the central portion thereof and extending downwardly within said casing; and

check valve means including an annular lip formed at the

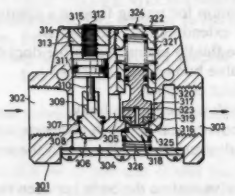


central portion of said seal member, said lip being normally in sealed contact with the outer periphery of said annular projection, said lip interacting with the outer periphery of said projection for allowing air flow from said lower chamber to said upper chamber when the pressure in said lower chamber rises above the atmospheric level and said seal member moves to said upper predetermined position, and means on the outer periphery of said projection for interacting with said lip for allowing air flow from said upper chamber to said lower chamber when the pressure in said lower chamber drops below the atmospheric level and said seal member moves to said lower predetermined position.

4,192,346
CONTROL VALVE

Tomomitsu Iizumi, Tokyo, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1977, Ser. No. 826,251
Claims priority, application Japan, Aug. 25, 1976, 113601[U]; Sep. 10, 1976, 121042[U]; Oct. 8, 1976, 134892[U]; Oct. 27, 1976, 144311[U]; Oct. 27, 1976, 144312[U]; Jul. 5, 1977, 881687[U]
Int. Cl.[2] F15B *11/02*
U.S. Cl. 137—599 5 Claims



1. A control valve particularly adapted for use together with a direction-changeover valve and with an actuator cylinder, said control valve comprising: a casing defining a first port adapted to be placed in fluid flow relationship with said direction-changeover valve and a second port adapted to be placed in fluid flow relationship with said actuator cylinder; fluid passage means provided in said casing for interconnecting in flow relationship said first and said second ports; pressure adjusting valve means operable between an open and a closed position provided in said fluid passage means; spring means biasing said pressure adjusting valve means so as to be opened when pressure in said second port exceeds a given pressure level; and throttling means operatively associated with said

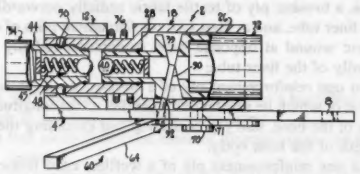
pressure adjusting valve means defining a throttled fluid flow passage between said first port and said second port to permit throttled fluid flow therebetween past said pressure adjusting valve means when said pressure adjusting valve means is in the closed position; said fluid passage means defining a first fluid flow passage and a second fluid flow passage each extending between said first port and said second port, said pressure adjusting valve means being located to control fluid flow through said first fluid flow passage from said first port to said second port, said control valve further including throttling valve means defining a throttling fluid flow opening through which fluid may flow through said second fluid flow passage from said second port to said first port.

4,192,347

HYDRAULIC COUPLER ASSEMBLY

Leroy J. Richard, 4567 Buena Vista Estates, Fargo, N. Dak. 58102

Filed Feb. 24, 1978, Ser. No. 881,002
Int. Cl.[2] F16L *37/22*
U.S. Cl. 137—614.06 **7 Claims**



1. An improved hydraulic coupler assembly of the type having a base plate; a fixed block and a movable block carried on the base plate for longitudinal movement relative to one another, the movable block having opposed male and female ends with the male end thereof being received inside the fixed block; means for biasing the fixed and movable blocks away from one another; first and second nipple members received respectively inside the male and female ends of the movable block, the first and second nipple members being connected respectively to first and second hydraulic lines; the movable block having locking means cooperable with a locking surface on the fixed block for locking the first nipple member in a fixed position in the male end of the movable block; and wherein the improvement comprises:

(a) an elongated slot located in the base plate; and

(b) a lever pivotably connected to the movable block by a pivot pin on which the lever is rotatably journaled, the lever including a cam carried therewith which cam is operatively located in the base plate slot, the cam being configured such that rotation of the lever about the pivot pin causes the cam to act inside the base plate slot to move the movable block through the pivot pin toward and away from the fixed block to respectively unlock and lock the locking means for the first nipple member, a support plate carried on the lever, wherein the support plate mounts the cam and covers that portion of the base plate slot in which the cam is operative to protect the cam fron contamination by foreign materials, whereby the first nipple member may be easily disconnected from or connected to the male end of the movable block.

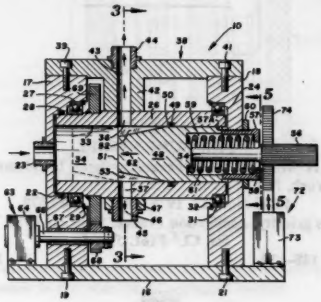
4,192,348

FLUID CONTROL UNIT

Craig N. Hansen, St. Paul, Minn., assignor to Hansen Engine Corporation, Minneapolis, Minn.

Filed Apr. 10, 1978, Ser. No. 894,752
Int. Cl.[2] F16K *31/04*
U.S. Cl. 137—624.15 **43 Claims**

1. A control unit operable to intermittently discharge a fluid comprising: a support, first means having a chamber mounted for rotation on the support, said first means having at least one fluid discharge opening, said support having means for allowing fluid under pressure to flow into the chamber, a piston located in the chamber and movable in said chamber from a first position to a second position, said piston having at least one groove alignable with the discharge opening when the piston is moved from the first position toward the second position, thereby allowing fluid to flow through the discharge



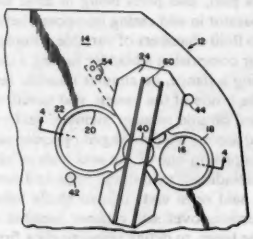
opening, biasing means acting on the piston to move the piston to the first position, said piston being moved from the first position toward the second position by the pressure of the fluid in the chamber, and second means operable to provide relative rotation between the first means and piston, whereby the discharge opening in the first means is sequentially aligned with the groove in the piston so that the fluid is intermittently discharged through the discharge opening from the control unit.

4,192,349

AIR CONDITIONING VALVE

Robert W. Schroeder, Malibu, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1978, Ser. No. 931,794
Int. Cl.[2] F16K *3/02, 11/02, 35/02*
U.S. Cl. 137—878 **5 Claims**



1. An air conditioning valve comprising: a relatively flat base with parallel inlet and outlet openings therethrough, and having valve seats therearound on one side; a rotary flapper valve cover pivotably mounted relative to said base and having means for covering and sealing said openings when in a closed position, said means for covering and sealing said openings being on opposite sides of and interconnected by structure which provides the pivotal mounting of said rotary flapper valve cover relative to said base, and said rotary flapper valve cover being rotatable to a position in which said inlet and outlet openings are each uncovered by said rotary flapper valve cover to allow fluid passage therethrough, said rotary flapper valve cover being pivotably mounted by a bolt means keyed to said valve cover and passing through an opening in said base, and biasing means connected between said base and

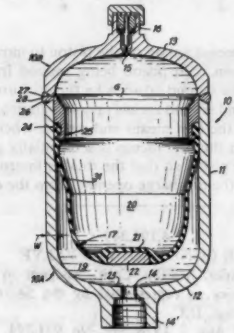
said bolt means, said biasing means biasing said valve cover onto said valve seats and said valve cover in a closing direction.

4,192,350

PRESSURE VESSEL

Jacques H. Mercier, Paris, France, assignor to Normand Trust, New York, N.Y.

Filed Nov. 27, 1978, Ser. No. 963,678
Claims priority, application France, Dec. 22, 1977, 77 38738
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—30 17 Claims



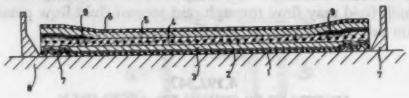
1. In a pressure vessel comprising a casing of rigid metallic material having a body with two closed ends, each said closed end having a port, said ports being in axial alignment, a deformable separator in said casing interposed between said ports to define two fluid chambers of variable volumes, said deformable separator comprising a bladder having a closed end and a mouth forming a flange, an annular metallic retainer member secured to the inside of the casing, said mouth of said bladder being mounted on said retainer member, said casing comprising a first and second shell arranged opposite each other, each said shell comprising one of the said ends of said casing, said shells each including a cylindrical open end terminating in an annular rim, said open ends of said shells being mounted in opposite directions over said retainer member and intimately contacting the latter, to define respectively a first and a second annular contact zone delimited by said rim; the improvement comprising said first and second zones being separated by an annular intervening zone in which a portion of the said retainer member is exposed, an annular welding band extending along said rim of the said shells and said intervening zone to connect said rims and said retaining member, said pressure vessel being further characterized in that the retainer member is formed from a metal having a melting point below that of said shells and has a first portion with a relatively large mean thickness in the area of said first annular contact zone, and a second portion with a smaller mean thickness in the area of said second annular contact zone and of said intervening zone, the mouth of the bladder being mounted on the retainer member at a position on the same side of said intervening zone as said first annular contact zone.

4,192,351

VARIABLE FLEX HOSE

Brian Henry, Portadown, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 8, 1978, Ser. No. 904,179
Claims priority, application United Kingdom, Jul. 25, 1977, 31191/77
Int. Cl.[2] B31C *13/00*; F16L *11/12*
U.S. Cl. 138—126 13 Claims



1. A large bore suction and discharge hose structure of elastomeric material exhibiting a variable flexibility comprising:

a hose body including a radially innermost elastomeric liner tube, a breaker ply of textile fabric radially outwardly of the liner tube, and at least two reinforcement plies of cord fabric wound at opposite hand orientation radially outwardly of the liner tube;

at least one reinforcement ply of a weftless cord fabric the cords of which lie substantially parallel to the longitudinal axis of the hose, said ply encircling and extending the full length of the hose body;

at least one reinforcement ply of a weftless cord fabric the cords of which lie substantially parallel to the longitudinal axis of the hose, said ply encircling the hose body and extending but for a portion of the length of the hose body; and

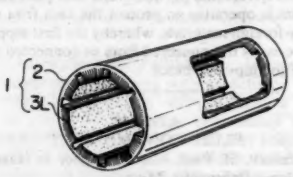
a radially outermost elastomeric cover ply; all of said plies being vulcanized into an integral hose structure.

4,192,352

INSULATOR FOR COVERING ELECTRIC CONDUCTORS

Takeshi Hakamada; Misao Soma, and Ikushi Kano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 1, 1975, Ser. No. 601,044
Claims priority, application Japan, Aug. 9. 1974, 49-90834
Int. Cl.[2] H01B *7/02, 3/00*
U.S. Cl. 138—149 14 Claims



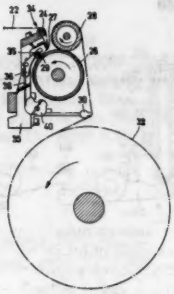
1. An insulator for covering electric conductors comprising a flexible plastic tube of polyimide film and a soft material layer of polyamide non-woven fabric secured to the inner surface of said tube, said soft material layer covering substantially the entire inner surface of said tube.

4,192,353

CLOTH TAKE-UP SYSTEM

Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 27, 1978, Ser. No. 919,712
Claims priority, application Switzerland, Jul. 6, 1977, 8317/77
Int. Cl.[2] D03D *49/20*
U.S. Cl. 139—307 14 Claims



1. A cloth take-up system for taking-up a travelling length of cloth in a weaving machine comprising

a first cloth deflection element disposed in the path of cloth travel;

a cloth take-up roller located below said first cloth deflection element;

a deflecting roller downstream of said take-up roller relative to the direction of cloth travel, said deflecting roller being disposed above said take-up roller;

a cloth beam below said take-up roller for winding of the cloth thereon; and

a second cloth deflection element having a non-rotatable deflecting surface disposed in the path of travel of the cloth between said first deflection element and said take-up roller to deflect the cloth towards said take-up roller and said deflecting roller and increase the wrapping angle of the cloth about said take-up roller.

4,192,354

SHUTTLE SENSING MEANS FOR WEAVING MACHINE CATCHER MECHANISM

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 26, 1978, Ser. No. 910,088
Claims priority, application Switzerland, Jun. 1, 1977, 006707/77
Int. Cl.[2] D03D *51/40*
U.S. Cl. 139—342 7 Claims

1. A catcher mechanism for a gripper shuttle comprising

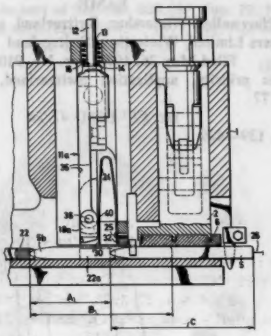
a housing;

a braking means in said housing for braking a gripper shuttle into a stop position;

a push-back member in said housing for pushing a stopped gripper shuttle from a stop position into a yarn release position;

a spring member mounted in said housing; and

a sensing element mounted within an opening in said housing for movement into the path of a gripper shuttle, said sensing element being mounted adjacent said spring member whereby said sensing element is adapted to be pressed against said spring element by said push-back member in the direction of a push-back movement of said push-back member in the absence of a gripper shuttle.

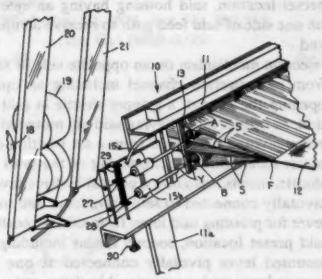


4,192,355

APPARATUS FOR LOOMS HAVING FLUID OPERATED YARN INSERTION MEANS

Burin A. Peeler, Shelby, and Henry P. Neisler, Kings Mountain, both of N.C., assignors to Dicey Fabrics, Inc., Shelby, N.C.

Filed Dec. 11, 1978, Ser. No. 968,620
Int. Cl.[2] D03D *47/28*
U.S. Cl. 139—435 3 Claims



1. For use in a loom having spaced fluid insertion means for carrying respective filling yarns into a shed, a reed comprising:

a plurality of spaced aligned dents defining spaced yarn tunnels within a shed for receiving respective filling yarns from said fluid insertion means;

said tunnels having opposed yarn exit eyes opening toward each other in opposed relation; and

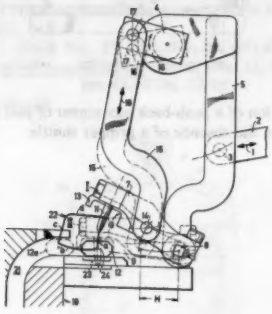
an intermediate connecting portion of each of said dents between said tunnels receiving adjacent filling yarns from adjacent tunnels and thereafter beating up the filling yarns into a fell of the cloth being woven.

4,192,356

CATCHER MECHANISM IN A GRIPPER PROJECTILE WEAVING MACHINE AND METHOD OF OPERATING SAME

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 26, 1978, Ser. No. 910,087
Claims priority, application Switzerland, Jun. 1, 1977, 006708/77
Int. Cl.[2] D03D *47/24*
U.S. Cl. 139—439 2 Claims



1. A catcher mechanism for a gripper shuttle having a pair of jaws for holding a yarn therebetween, said mechanism comprising

a housing disposed in a feed path of a series of gripper shuttles to sequentially receive a gripper shuttle therein at a preset location, said housing having an ejection channel on one side of said feed path to receive an ejected shuttle; and

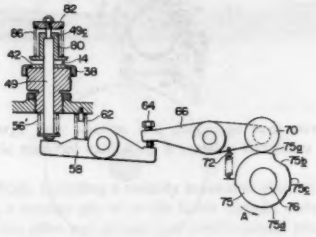
an ejection mechanism on an opposite side of said feed path from said ejection channel including an opener pin for opening the jaws of a gripper shuttle at said preset location, an opener lever having said pin mounted thereon and being pivotally movable from a set position towards said preset location to effect opening of the jaws of a gripper shuttle, means including a pivotable drive lever and a link pivotally connected to said drive lever and to said opener lever for pivoting said lever from said set position towards said preset location, second means including a pivotally mounted lever pivotally connected at one end to said opener lever and a reciprocable drive rod connected to said opener lever and to said pivotally mounted lever at an intermediate point for reciprocally moving said lever laterally of said feed path from said preset location to an ejection position and a shaft having said lever of said second means and said drive lever of said first means pivotally mounted thereon, said first means and said second means being disposed to pivot said lever away from said ejection position to permit ejection of a gripper shuttle thereat and to a position with said lever and said pin out of said feed path prior to a return movement of said lever laterally to said set position whereby a following gripper shuttle can be received at said preset location.

4,192,357

WEFT YARN GRASPING APPARATUS FOR FLUID JET LOOM

Shigenori Tanaka, Hachioji; Akio Tojo, Higashi-murayama; Kimimasa Ohnishi, Tokyo, and Takeshi Kikuchi, Chofu, allof, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 27, 1977, Ser. No. 836,958
Claims priority, application Japan, Dec. 27, 1976, 51-157739
Int. Cl.[2] D03D *47/34*
U.S. Cl. 139—450 9 Claims



1. A weft yarn grasping apparatus for a fluid jet weaving loom having a jet nozzle for inserting a weft yarn, by the aid of a fluid jet stream, into the shed of warp yarns, said apparatus comprising:

gripping means by which said weft yarn is selectively gripped and released in response to the weaving operation of said loom; and

actuating means for actuating said gripping means to take first, second and third states thereof under the picking of said weft yarn, the beating of said weft yarn and a condition other than said picking and beating, respectively, said first state being a state in which said weft yarn is completely released by said gripping means, said second state being a state in which said weft yarn is softly gripped by said gripping means such that when a predetermined magnitude of tension is applied to said weft yarn, a slippage of said weft yarn is given by said gripping means to draw out a bit of said weft yarn from said gripping means, said third state being a state in which said weft yarn is strongly gripped by said gripping means such that even when said predetermined magnitude of tension is applied to said weft yarn, the slippage of said weft yarn is prevented,

said gripping means including:

movable and stationary members capable of defining therebetween a clearance in which said weft yarn is inserted, said members being respectively formed with openings which are aligned;

a rod member slidably passing through the aligned openings of said movable and stationary members and having first and second ends thereof which are outwardly projected from the respective movable and stationary members, said rod member being formed with an engaging section which is brought into contact with a portion of said movable member to move the same in a direction to increase said clearance when said rod is moved in a first direction beyond a predetermined distance;

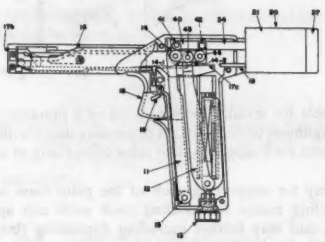
a stop member fixed to said first end of said rod, said stop member being contactable with said movable member to move the same in a direction to decrease said clearance when said rod is moved in a second direction, said first and second directions being opposite to each other;

first biasing means for biasing said rod in said second direction; and

second biasing means disposed between said movable member and said stop member for biasing said movable member in the direction to decrease said clearance, the biasing

force of said second biasing means being set smaller than that of said first biasing means.

4,192,358
AIR POWERED INSTALLATION OF FASTENERS
Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Aug. 21, 1978, Ser. No. 935,206
Int. Cl.[2] B21F 9/02
U.S. Cl. 140—123.6 6 Claims



1. An improved tool for tensioning an item having a free end, of the type including means for gripping and drawing the free end of the item, means for severing an end portion of said item, apparatus for applying force to said drawing means to apply tension to the end of said item, and means for operating the severing means when the applied force reaches a prescribed level, wherein the improvement comprises improved apparatus for applying force to said drawing means, comprising:

a piston and piston rod assembly, housed in a piston chamber having actuating and non-actuating ends;

a valve assembly having activated and non-activated positions, comprising

a housing containing a channel, wherein the wall of the channel includes a "pressurizing" aperture and a "venting" aperture, with the pressurizing aperture connected by a duct to the source of high pressure air and the venting aperture connected to a venting port, and wherein a tunnel terminating in the channel between said apertures connects the channel to the piston chamber;

a valve spool which may slide within said channel;

a filler member creating a narrowed segment of said channel, located between said pressurized and venting apertures, whereby the tunnel connects the piston chamber to the narrowed segment of the channel;

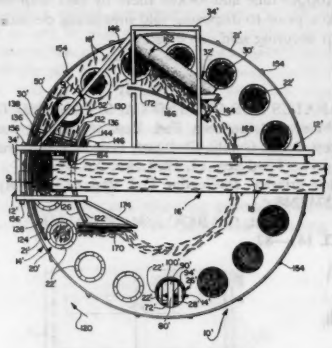
first and second capping members on each end of said valve spool configured such that when the valve spool is in the activated position, the first capping member seals the narrowed segment of the channel from the venting aperture, whereas when the valve spool is in the non-activated position, the second capping member seals the narrowed segment of the channel from the pressurizing aperture;

a source of high pressure air;

activating means for urging the valve spool and capping members towards the activated position in response to an input signal; and

means for linking the piston rod and the drawing means, and for causing force to be applied to said drawing means when the piston moves toward the actuating end of the piston chamber.

4,192,359
CONTAINER FILLING APPARATUS AND METHOD
Roy L. Pippin, P.O. Box 1077, Plant City, Fla. 33566
Continuation-in-part of Ser. No. 808,657, Jun. 21, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 849,172
Int. Cl.[2] B65B 1/04
U.S. Cl. 141—12 18 Claims



12. The method of filling a container with a mass of units of an elongated material, comprising the steps of:

positioning the container in communication with a port in a horizontal surface;

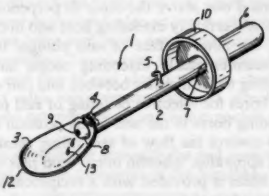
depositing the material through the port to fill the container;

continuing depositing material to a level above the upper termination of the container;

compressing the material into the container to compact the mass of material in the container to reduce the voids therein; and

propelling the material along the horizontal surface in a direction generally opposite to the direction of movement of the horizontal surface.

4,192,360
SPOON DROPPER
Oswaldo J. Rodriquez, 5751 Riverdale Rd., Apt. 2E, College Park, Ga. 30349
Filed May 19, 1978, Ser. No. 907,714
Int. Cl.[2] B65B 3/30
U.S. Cl. 141—24 3 Claims



1. A measuring device combination comprising:

a liquid dropper tube having a first tube terminus and having a flexible compressible bulb secured thereon, said dropper tube having a second tube terminus which includes a tube orifice, said dropper tube having a desired liquid volume, said dropper tube having a thermoplastic composition,

a cap closure mounted on said liquid dropper tube,

a hinge means integrally secured to said second tube terminus adjacent to said tube orifice, said hinge means having a thermoplastic composition,

a spoon bowl integrally secured to said hinge means, said spoon bowl hingedly movable to accept liquid from said

tube orifice, said spoon bowl having a thermoplastic composition and a bowl volume, and

a flexible snap lock projection integrally secured to said dropper tube exterior, said projection being disposed at a position operative to provide a lock for a spoon bowl tip opposed to said hinge means, whereby said spoon bowl can be foldably secured coplanarly adjacent to said liquid dropper tube and locked there by said snap lock projection, prior to disposing said measuring device in a bottle for securing said cap closure.

4,192,361

APPARATUS FOR FILLING CAPSULES AND THE LIKE

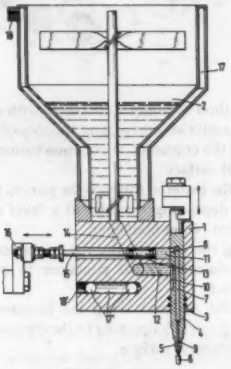
Theo Moser, Steinenberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1978, Ser. No. 943,900

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742248

Int. Cl.[2] B67C *3/26*; G01F *11/38*

U.S. Cl. 141—82 **3 Claims**



1. A dispensing apparatus for dispensing liquid, pasty or similar substances such as substances containing medicaments into hard gelatin capsules or the like comprising in combination, a housing having a vertically extending bore, a control plunger including a filling nozzle arranged for reciprocating axial movement between a filling position wherein said filling nozzle extends into a capsule to be filled and a non-filling position, said housing having a pair of horizontally extending bores disposed one above the other in perpendicular relationship with said vertically extending bore and in communication therewith, the outer surface of said plunger being provided with a circumferentially extending recess having a length corresponding to the distance between said pair of horizontally extending bores for selective coupling of said pair of horizontally extending bores in the non-filling position of said control plunger to control the flow of said filling substance into said dispensing apparatus, wherein one of said pair of horizontally extending bores is provided with a reciprocally movable metering piston adapted to draw material through said recess and said other horizontal bore from a supply in the non-filling position of said control plunger, said control plunger being provided with an axially extending bore communicating at one end with the filling nozzle end of said plunger, and a radially extending bore communicating at one end with the other end of said axially extending bore, said radially extending bore being arranged to communicate at its other end with said one horizontally extending bore in said filling position of said control plunger, whereby a metered amount of said material is dispensed from said one horizontal bore by said piston into said radially and axially extending bores out said filling nozzle, in the filling position of said control plunger.

4,192,362

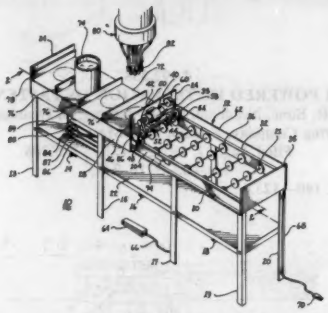
PAINT MIXING TABLE

John J. Achen, P.O. Box 5287, Yuma, Ariz. 85364

Filed Sep. 11, 1978, Ser. No. 941,145

Int. Cl.[2] B65B *43/54*

U.S. Cl. 141—177 **2 Claims**



1. A table for serially locating each of a plurality of paint cans in alignment with a pigment dispensing unit for dispensing pigment into each paint can, said table comprising in combination:

(a) a tray for supporting each of the paint cans, said tray including means for locating each paint can upon said tray, said tray further including depending flanges disposed at opposed sides thereof;

(b) a conveyor having a longitudinal axis for accommodating reciprocal translatory motion of said tray with respect to the dispensing unit, said conveyor including side rails for engagement with said depending flanges to limit motion of said tray to motion along the longitudinal axis of said conveyor;

(c) drive means for imparting translatory motion to said tray with respect to said conveyor;

(d) switch means for controlling said drive means to impart incremental motion to said tray in either direction along the longitudinal axis of said conveyor;

(e) a shelf disposed beneath said conveyor for supporting a paint can; and

(f) said conveyor including a removable section in general vertical alignment with both the dispensing unit and a part of said shelf;

whereby, the paint cans are serially positionable in alignment with the dispensing unit or upon said shelf to receive dispensed pigments.

4,192,363

AUTOMATIC PROFILE-COPYING DEVICE

Gianfranco Casadei, Villa Verucchio (Forli), Italy

Filed Mar. 3, 1978, Ser. No. 883,026

Claims priority, application Italy, Mar. 3, 1977, 20864 A/77

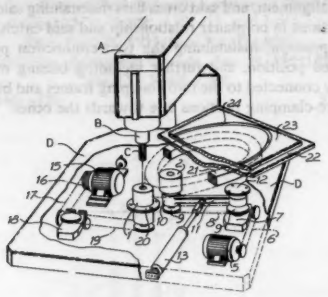
Int. Cl.[2] B23C *1/18*

U.S. Cl. 144—145 A **3 Claims**

1. An improved profile-copying device for a milling machine having a work tool of the type including a rotatable central roller having an axis fixably and coaxially disposed relative to the axis of the work tool and a rotatable side roller having an axis disposed parallel to said axis of said central roller, means for driving at least one of said rollers and means for biasing said side roller in a direction towards said central roller so as to enable a profile to be inserted between and held by said rollers and advanced therebetween upon activation of said drive means, the improvement comprising:

said drive means comprising first drive means including a motor coupled to said central roller for rotating said central roller at an adjustable but constant speed, and second

drive means coupled to said side roller for rotating said side roller at a variable speed as a result of which both of



said rollers supply a torque to effect advancement of a profile fed between said rollers.

4,192,364

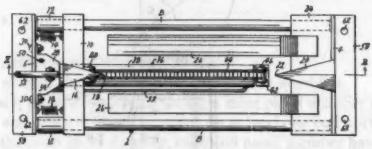
LOG SPLITTING DEVICE

Charles A. Findley, 7006 Rowland, Kansas City, Kans. 66109

Filed Jun. 5, 1978, Ser. No. 912,499

Int. Cl.[2] B27L *7/00*

U.S. Cl. 144—193 A **8 Claims**



1. A log splitting device comprising:

a. a frame,

b. a pair of confronting knife edged wedges having generally parallel cutting edges carried by said frame, one of said wedges being fixed relative to said frame and the other of said wedges being movable relative to said frame in a direction normal to the cutting edges of said wedges,

c. support means on said frame for supporting a log in endwise relation between said wedges, and

d. power means carried by said frame and operable to move said movable wedge toward said fixed wedge, whereby said log is split from either or both ends.

4,192,365

ORGANIZER HANDBAG

Milton I. Siegel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.

Continuation of Ser. No. 802,114, May 31, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,043

Int. Cl.[2] A45C *3/06, 1/08*

U.S. Cl. 150—35 **2 Claims**

1. An organizer handbag for the orderly and accessible reception of personal convenience items comprising:

(a) a body having a bottom panel, a front panel and a rear panel having upper horizontal edges and side and bottom edges, said side edges being joined to an expandable end wall member on each side of said front and rear panels, the bottom edges and end wall members being joined to said bottom to form a main compartment;

(b) at least two transverse panels extending between and secured to each respective end wall member sub-dividing the main compartment into at least three subcompartments comprising:

(i) a front subcompartment formed between one of said transverse panels and said front panel;

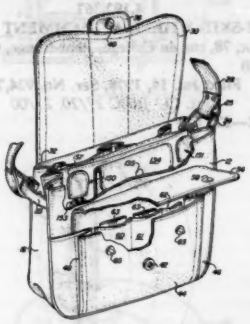
(ii) an intermediate subcompartment adapted to secure a removable pouch at a position wherein an edge of said pouch is substantially co-extensive with the top of said main compartment; and

(iii) a rear compartment formed between one of said transverse panels and said front panel;

(c) pocketbook means detachably secured to one of said panels at one of said subcompartments near the upper edge thereof whereby the pocketbook is readily accessible through the said subcompartment and whereby the pocketbook may be easily attached or detached when the handbag is in an open position;

(d) storage compartment means located within at least one of said subcompartments, said storage compartment means being adapted to receive a card carrying case for selective display of documents;

(e) an exterior pouch panel extending generally transversely across the front of said front panel and extending vertically from the bottom to a location below the upper horizontal edge of said front panel and being joined thereto at opposite vertical edges and along the bottom edge, an insert panel extending intermediate said pouch panel and said front panel forming an insert pocket between said front panel and said insert panel and an exterior pouch between said insert panel and said pouch panel, said insert panel having a vertical extension forming a flap moveable to a closed position overlying said pouch panel, said pouch further including interior pocket means adapted for reception of writing materials; and



(f) a flap hingedly affixed to the said rear panel substantially near the upper horizontal edge and moveable to a closed position over-lying said front panel and having an open position permitting free access to said interior subcompartments, said flap in said closed position obscuring the contents of said subcompartments and simultaneously covering said exterior pouch and insert pocket for added security;

(g) the bottom panel being generally flat and generally defining the total bottom perimeter of the handbag.

4,192,366

PNEUMATIC TIRE WITH MEDIUM VINYL POLYBUTADIENE/POLYISOPRENE BLEND TREAD

Richard M. Scriver, Jr., Atwater, and Waldemar A. Ross, Bolivar, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 22, 1978, Ser. No. 879,985

Int. Cl.[2] B60C *1/00*; C08L *23/18*

U.S. Cl. 152—209 R **3 Claims**

1. In a pneumatic rubber tire which comprises a generally toroidal shaped carcass with an outer circumferential ground contacting tread, spaced beads and sidewalls extending radially

from and connecting said tread to said beads, where said tread is a cured elastomeric composition containing a medium vinyl polybutadiene, the improvement in which said tread is a cured elastomeric composition comprised of, based on 100 parts by weight rubber, (A) about 55 to about 75 parts by weight cis 1,4-polyisoprene rubber and correspondingly, (B) about 45 to about 25 parts by weight of a medium vinyl polybutadiene rubber having about a 35 to about 45 weight percent vinyl content (1,2-content) about 10 to about 40 weight percent cis 1,4-content and, correspondingly, 15 to about 55 weight percent trans 1,4 content and having a ML (100° C.) hardness in the range of about 40 to about 120, in which said elastomer composition is cured with a sulfur content in the range of about 2 to about 2.4 phr in an amount equivalent to about 25 to about 40 weight percent more than the sulfur content which would be required according to the test of maximizing the time to failure of the cured rubber composition according to blow-out test ASTM D-623, in which only for the purpose of said test, the medium vinyl polybutadiene is replaced with high cis 1,4-polybutadiene rubber.

4,192,367

ANTI-SKID WHEEL ATTACHMENT DEVICE

Ovila Chabot, 78, rue du College, Pont-Rouge, Quebec, Canada (G0A 2X0)

Filed Jul. 14, 1978, Ser. No. 924,743
Int. Cl.[2] B60C *27/20, 27/00*
U.S. Cl. 152—225 C **4 Claims**

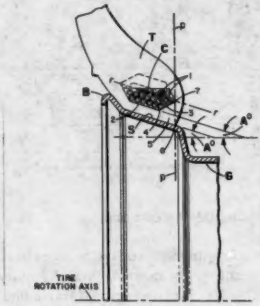
3. An anti-skid wheel attachment device comprising separate first and second clamping frames, each including an outer generally U-shaped tire-clamping portion and an inner connection portion, said inner connection portion comprising a pair of spaced substantially parallel co-planar side bars adapted to be removably positioned across the exposed side of a vehicle wheel in aligned and overlapping position, each pair of side bars being rigidly interconnected by a first and a second cross bar interconnecting the outer portions and the inner ends of said side bars, respectively, said second cross bar of said first clamping frame being secured to the underside of the side bars of said first clamping frame and having a central boss level with the outer side of said side bars, said central boss defining a pair of recesses, one adjacent the related side bar, an arm pivoted on said boss intermediate its ends and pivotable between a locking position extending across said side bars of said first clamping frame and closing said recesses, and an unlocking position clearing and opening said recesses, said second cross bar of said second clamping frame extending across the outer side of the side bars of said second clamping frame and protruding beyond said same side bars, the spacing between the side bars of said second frame being less than the spacing between the side bars of said first frame, said side bars being telescopically and slidably interfitted with the side bars of said second frame slidably engaging said recesses, and said arm in transversely extending locked position overlying said side bars of said second frame and with said protruding end portions of the second cross bar of said second clamping frame overlying the side bars of the first clamping frame, so arranged that the two connection portions can be assembled and separated by relative movement toward and away from each other in a direction transverse to the planes of said connection portions, the side bars of the respective pairs being in longitudinal slidable contact two by two for maintaining the connection portions in alignment, and said cross bars maintaining said connection portions in co-planar relationship and said catch, when in locked position, maintaining the two connection portion in assembled position, and further including biasing means detachably connected to the two clamping frames and biasing the outer tire-clamping portions one towards the other.

4,192,368

TIRE CORE BEAD FOR TUBELESS TIRES

Luigi Maiocchi, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Dec. 5, 1977, Ser. No. 857,446
Claims priority, application Italy, Dec. 13, 1976, 30335 A/76
Int. Cl.[2] B60C *13/04*
U.S. Cl. 152—362 R **4 Claims**



1. A vehicle tire of the type for being fitted onto a one-piece undetachable rim of the drop-center type and having its bead-seats for the tire beads shaped like a truncated cone with the vertex axially turned towards the inside of the rim,

said beads having bead bases which are substantially a frustrum-shaped surface for combining with the said bead-seat, and having approximately the same angle of inclination as the latter,

said beads being provided with a reinforcing metallic wire core, said wire core comprising a plurality of metallic turns closely wound together so as to constitute substantially a massive annular element that is circumferentially inextensible, and having a cross-section of a polygonal shape,

the radially innermost side, with respect to the axis of rotation of the tire, of said polygon being the core base, the side of said polygon having one end in common with the axially internal end, with respect to the equatorial plane of the tire, of said core base being the undercut,

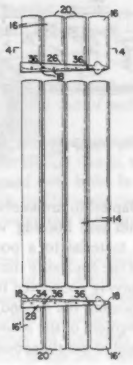
the dihedral angle defined by the core base with the undercut being between 90° and 160°, said tire being charcterized in that it comprises said wire core disposed in the bead with the axially innermost extremity, with respect to the equatorial plane of the tire, of said undercut lying substantially on a plane perpendicular to the axis of rotation of the tire and passing through the axially innermost extremity of the bead base.

4,192,369

ADJUSTABLE DECORATIVE SHUTTER

Ian D. Taylor, Beaconsfield, Canada, assignor to Hunter Douglas International N.V., ANX

Filed Feb. 23, 1977, Ser. No. 771,098
Claims priority, application Canada, Jan. 26, 1977, 270496
Int. Cl.[2] E06B 7/08
U.S. Cl. 160—223 3 Claims



1. A decorative shutter comprising:

(a) a plurality of parallel elongated panel assemblies;

(b) each panel assembly including a main panel member and an end panel member mounted on at least one end portion of the main panel member, each end panel member having an inner end, and an outer end directed outwardly and away from the main panel member;

(c) each of the panel members having opposed longitudinal edge portions shaped such as to retain said end panel members on said end portions of the main panel member and in telescoping mating relation therewith such as to allow said end panel members to be slid to and fro relative to their associated main panel members in a direction parallel to said opposed longitudinal edge portions;

(d) means for retaining said panel assemblies in said parallel relationship including a connector member extending transversely of said panel assemblies and connected to each of the end panel members situated at one end of said main panel members to enable said end panel members to be slid to and fro as a group relative to their associated main panel members thereby to effect variations in the overall length of the shutter;

(e) and wherein said connector member is a rigid member secured to all its associated end panel members in overlapping relation to the inner edges of the inner end portions of the end panel members such that said connector members conceals such inner edges from view and thus imparts a unitary appearance to each of the panel assemblies of the shutter;

(f) wherein each panel member has a major frontal surface and a back surface with said longitudinal edge portions of each panel member being curved inwardly toward each other in directions away from said major frontal surface and the longitudinal edge portions of the end panel members closely embrace the longitudinal edge portions of their associated main panel member; and

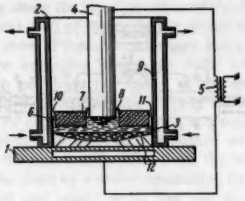
(g) the outer ends of said end panel members being free of any connection with any adjacent outer ends of end panel members.

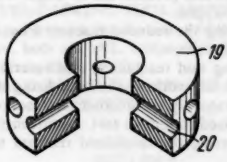
4,192,370

DEVICE FOR EFFECTING ELECTROSLAG REMELTING PROCESSES

Volf I. Rabinovich; Jury N. Kriger, both of Chekhov; Igor A. Svitenko, Moscow, and Viktor E. Sapunov, Chekhov, all of U.S.S.R., assignors to Chekhovsky Zavod Energeticheskogo Mashinostroenia, U.S.S.R.

Division of Ser. No. 638,942, Dec. 8, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,695
Int. Cl.[2] B22D 27/02
U.S. Cl. 164—252 3 Claims





1. A device for effecting an electroslag remelting process, comprising a baseplate on which is mounted a means for effecting an electroslag remelting process; a molten slag bath set up in said means for effecting an electroslag remelting process; an electrode having one of its ends dipped into said slag bath, its other end being connected to a current source; a protective shield positioned concentrically around the end of said electrode being dipped into said slag bath; said shield being made as a disc of an electrically conductive material which has a higher electrical conductivity than that of the molten slag and whose specific density is lower than that of the slag of said slag bath, said disc overlapping essentially the entire surface area of said slag bath and being arranged in said means for effecting an electroslag remelting process with a clearance between an internal surface of said means for effecting an electroslag remelting process and a side wall of said disc that amounts to at least the thickness of a scull crust on the internal surface of said means for effecting an electroslag remelting process, and with a clearance between the wall of the opening said disc and said electrode that is equal to at least the thickness of a scull crust of said electrode, and said protective shield being made as a disc with through radial conduits running inside said disc from its center to the periphery thereof.

4,192,371

PROCESS FOR SUPPLYING THERMAL ENERGY FOR AN ENDOTHERMIC REACTION FROM A SOURCE NOT AVAILABLE AT THE REACTION SITE

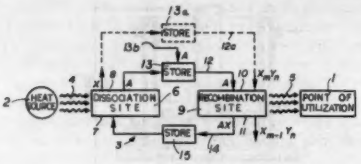
Jean-Jacques Derouette, Onex; Jacques Dartoy, Grand-Lancy, both of Switzerland; Jacques Fournier, Sciez, France, and Bernard Vollerin, Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland and Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 12, 1977, Ser. No. 824,308

Claims priority, application Switzerland, Aug. 13, 1976, 10312/76

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—1 **20 Claims**



1. A process for the recovery of a constituent present in oxidized form in a compound which is available at a reaction site and is endothermally reducible in a predetermined temperature range, comprising the steps of:

(a) endothermally reducing at another location an oxidized reactant with the aid of thermal energy from a source not readily available at the reaction site, the reduction of said reactant proceeding in an elevated temperature range higher than said predetermined range, with release of the liberated oxygen;

(b) transferring the reduced reactant from said location to said reaction site;

(c) interacting said reactant at said reaction site with said compound for exothermally reoxidizing said reactant, the heat generated by the exothermic reaction being at least partly utilized to reduce said constituent;

(d) retransferring the reoxidized reactant to said location; and

(e) repeating steps (a) through (d).

14. A process for producing a synthesis gas, comprising the steps of:

(a) endothermally dissociating at a first location a metal carbonate, with the aid of thermal energy from an external source, into a metal oxide and carbon dioxide;

(b) transferring said metal oxide to a second location;

(c) exothermally recombining said metal oxide at said location with carbon dioxide to reconstitute said metal carbonate;

(d) endothermally decomposing an organic substance in contact with said metal oxide at said second location, with the heat generated by the reaction of step (c), into several constituents including methane, hydrogen and carbon monoxide;

(e) retransferring the reconstituted metal carbonate to said first location; and

(f) repeating steps (a) through (e).

4,192,372

ADJUSTABLE LEVER FOR FIRE DETECTION SYSTEM

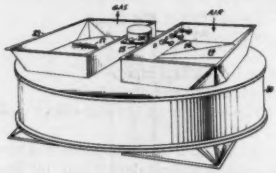
Kenneth O. Bellows, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Aug. 3, 1978, Ser. No. 930,461

Int. Cl.[2] F28D *19/00*; F28G *15/00*

U.S. Cl. 165—5 **5 Claims**

1. Rotary regenerative heat exchange apparatus having a housing with inlet and outlet ports for a heating fluid and a fluid to be heated, a matrix of heat absorbent material carried in said housing, means for alternately subjecting said matrix to the heating fluid and to the fluid to be heated, a series of infra-red ray detecting heads arranged to view a portion of the matrix, a series of openings in said housing adapted to simultaneously receive each infra-red ray detecting head, a series of air locks each comprising an open ended enclosure having an open end thereof confronting each opening of the housing, a first lever arm carrying each detecting head, gear means pivoted upon said housing adapted to arcuately move each lever arm from a position within said housing where it faces the matrix of heat absorbent material to a position where it is seated upon an open end of the enclosure that comprises the air lock, a second lever operatively connected to said gear means, a prime mover for reciprocating the second lever, and means for varying the lateral movement of the second lever to permit each infra-red detecting head to simultaneously seat on an open side of said enclosure.



4,192,373

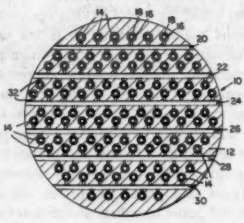
LEAK DETECTION SYSTEM FOR DUPLEX TUBE HEAT EXCHANGERS

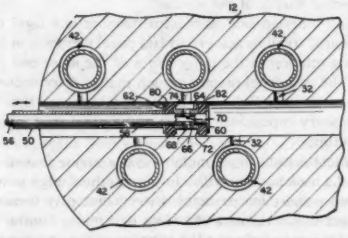
Walter Wolowodiuk, New Providence, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 31, 1977, Ser. No. 847,335

Int. Cl.[2] F24H *9/16*; G01M *3/04*

U.S. Cl. 165—70 **7 Claims**





1. In a heat exchanger in which a fluid is passed through a plurality of heat exchange tubes to place said fluid in indirect heat exchange with another fluid:

a plurality of heat exchange tubes, each having an inner wall

and a coaxial outer wall encircling and engaging against said inner wall, said inner wall extending axially farther than said outer wall at one end of said heat exchange tubes,

a tube sheet connected to each of said heat exchange tubes at said one end of said tubes, and having a plurality of annular spaces, each encircling one of said heat exchange tubes between the ends of said inner wall and said outer wall apparent to said one end of said heat exchange tubes, said tube sheet having a plurality of bores extending laterally of said tube sheet, each of said bores communicating with a portion of said annular spaces;

a probe comprising:

a pipe,

a sleeve encircling said pipe,

a first flange at one end of said pipe,

a second flange at the end of said sleeve closest to said one end of said pipe,

a ring encircling said pipe and positioned between said first flange and said second flange, said ring having holes substantially aligned with holes in said pipe,

a first deformable seal between said first flange and said ring,

a second deformable seal between said ring and said second flange,

wherein said probe can be moved axially along one of said bores so that one of said annular spaces communicates with the space between said seals, and said pipe and said sleeve can be manipulated so that said first flange is moved toward said second flange to compress said first deformable seal between said first flange and said ring, and to compress said second deformable seal between said second flange and said ring, whereby if the heat exchange tube associated with said annular space is leaking, the leaking fluid will flow into said annular collection chamber, through said holes in said ring and said pipe and along said pipe to a location lateral of said tube sheet.

4,192,374

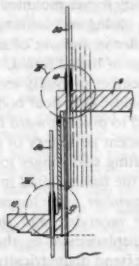
HEAT EXCHANGERS

Owen Hayden, Harwood; George E. Sheward, St. Annes; Derek T. Ormrod, Fulwood; Christopher R. Willby, Lymm, and George F. Firth, Croft, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 4, 1977, Ser. No. 765,745

Int. Cl.[2] F28F 9/04

U.S. Cl. 165—158 **12 Claims**



1. A heat exchanger comprising a shell adapted for conducting liquid metal and a bundle of heat exchange tubes within the shell for conducting water or steam, the shell having at least one tube sheet for passage of the tubes, each heat exchange tube extending through an individual aperture in the tube sheet with clearance between the tube and the tube sheet, the tube being sealed to the tube sheet by a sleeve upstanding from a face of the tube sheet and sealed at its free end to the outer wall surface of the tube, the tube and sleeve being bonded together by an interposed bonding metal to effect the seal, the bonding metal being of a kind not requiring, for the making of the bond, any recourse to temperature as high as would be required for the making of the joint by fusion welding.

12. A method of constructing a heat exchanger comprising an elongate vessel having inlet and outlet ports for liquid metal and housing a demountable heat exchange tube assembly, wherein the heat exchange tube assembly comprises:

a flanged extension forming a closure for the vessel,

a bundle of U-shaped heat exchange tubes having legs of unequal lengths suspended from the extension,

an annular shroud arranged co-axially with the lengthwise axis of the bundle and enveloping the bundle of 'U'-tubes,

a cylindrical baffle suspended from the extension and defining inner and outer annular chambers in the shroud, and

means for laterally supporting the 'U'-tubes from the baffle, the limbs of the 'U'-tubes extending parallel with the longitudinal axis of the vessel, a longer limb of each tube extending along the inner chamber of the shroud to penetrate an end wall of the extension which thereby forms a first tube sheet of the heat exchanger, and a shorter limb of each tube extending along the outer chamber of the shroud to penetrate the flange of the extension which thereby forms a second tube sheet of the heat exchanger, each leg of each tube penetrating a complementary tube sheet through an individual aperture with a clearance between the tube and the tube sheet, the tube being sealed to the tube sheet by a sleeve upstanding from a face of the tube sheet and sealed at its free end to the outer wall surface of the tube, the tube and sleeve being brazed together to effect a seal, the method including the steps of brazing each tube and sleeve combination individually using radio frequency electric induction heating means with an inert gas atmosphere enveloping the joint being brazed.

4,192,375

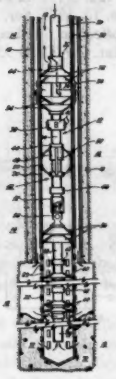
GRAVEL-PACKING TOOL ASSEMBLY

George P. Maly, Newport Beach, and Archibald M. Laurie, Santa Barbara, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Dec. 11, 1978, Ser. No. 968,483

Int. Cl.[2] E21B 43/04

U.S. Cl. 166—51 **5 Claims**



1. A tool assembly adapted for placement in a well for the purpose of forming a bed of granular material in a void space exterior to a perforate liner having substantially the same internal diameter as a casing string extending from said liner substantially to the earth surface, said tool assembly comprising:

crossover means adapted for connection with a tubing string and for placement in said well in sealable engagement with the interior of said casing string to thereby separate the

interior of said casing string and said liner into an upper section above said crossover means and a lower section below said crossover means, and adapted to provide fluid communication through a first passageway from the interior of said tubing string via a gravel port in said casing string to said void space and through a second passageway from the interior of a pipe extending from said crossover means into said lower section to a first annular space which surrounds said tubing string in said upper section;

check valve means adapted to allow fluid flow upwardly through said second passageway and to prohibit fluid flow downwardly through said second passageway;

bypass means coupled to and interposed between said pipe and said check valve means and adapted to selectively allow drainage of fluid from said first annular space downwardly through said second passageway and the interior of said pipe via said bypass means to a second annular space which surrounds said check valve means;

a pipe nipple coupled to said check valve means and having one or more apertures which allow fluid communication between said second annular space and the interior of said pipe nipple;

one or more annular swab cups attached to the portion of said pipe nipple below said apertures and adapted for sealable engagement with the interior of said casing string to thereby substantially prohibit fluid flow upwardly past said swab cups through the space between said pipe nipple and said casing string, said nipple and said swab cups being positioned in said tool assembly such that, upon placement of said tool assembly in said well, the apertures of said pipe nipple and said swab cups are adjacent a blank portion of said casing string spaced above the apertures of said perforate liner; and

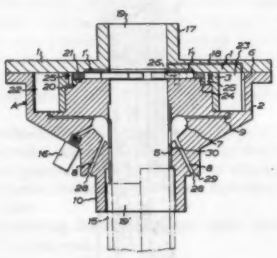
a baffled stinger pipe coupled to the bottom of said pipe nipple and having a plurality of annular yieldable baffles mounted at spaced intervals along said stinger pipe, each of said baffles being adapted to offer substantial resistance to fluid flowing in said casing string or said perforate liner past said baffles.

4,192,376

SHUTTING-OFF DEVICE

Per O. Lissmyr, Box 132, S-792 01 Mora, Sweden

Filed Jun. 13, 1978, Ser. No. 915,336
Claims priority, application Sweden, Jun. 17, 1977, 7707065
Int. Cl.[2] E21B *35/00*
U.S. Cl. 166—53 **8 Claims**



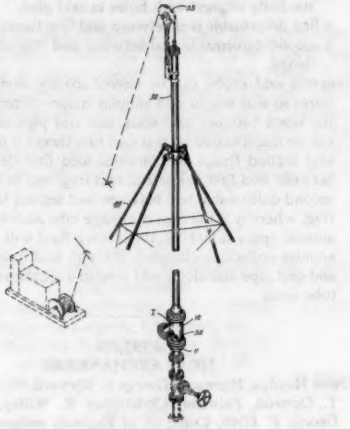
1. A device adapted to be fitted on a pipe end as an emergency device for shutting off fluid flowing out through the pipe under pressure, especially intended for use in drilling or extraction plants for oil, said device comprising two interconnected units provided with a throughpassage, including means on one end of said interconnected units for guiding the device into position over the effluent fluid jet to permit pulling the device onto the pipe end, a means in one of said interconnected units which senses the device as it achieves engagement with the pipe end and is adapted to branch off fluid from the jet at that moment, clamping means in one of said interconnected units for retaining the device to the pipe end, valve means in one of said interconnected units for closing the throughpassage, and cylinder-piston means actuated by branched-off pressure fluid of said sensing means to act on said clamping means and said valve means.

4,192,377

BOTTOM VALVE TRIPPING AND LIQUID CHANNELING DEVICE FOR AN AUTOMATED BAILER OF SHALLOW WELLS

Robert P. Defourneaux, Jr., 800 Morse La., River Ridge, La. 70123

Filed Oct. 30, 1978, Ser. No. 955,844
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—70 **1 Claim**



1. In an automated bailer having a pipe bailer with a bottom valve and attached stinger, a bottom valve tripping and liquid channeling device comprising:

(a) a cylindrical body means mounted on the top of a shallow well production casing and defining a longitudinal passage for said pipe bailer in and out of said well and a side exit for the discharge of bailed liquid;

(b) a channeled member pivotally mounted in the longitudinal passage of said cylindrical body and below said side exit, and adapted to pivot upward from a depending vertical position adjacent periphery of said passage to a transverse position lifting said stinger to trip said bottom valve for discharging the bailed liquid in said pipe bailer above said channeled member, said channeled member defining a blind recess for receiving and thereby stabilizing said stinger against displacement by the flow of bailed liquid and adapted to extend diametrically across said longitudinal passage;

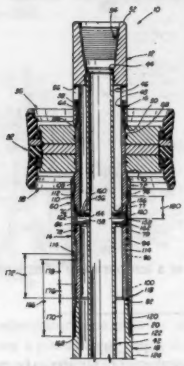
(c) a pair of spherical segments respectively fixed to opposite sides of said channeled member to extend radially outward for substantially closing said longitudinal passage when said channeled member is in its transverse position; and

(d) power actuated mechanical means for pivoting said channeled member and attached spherical segments between said vertical position clear of the passing pipe bailer and its transverse position substantially closing said passage for catching and channeling the flow of discharged liquid of said pipe bailer to and through said side exit.

4,192,378
PORT VALVE ISOLATION PACKER

Eugene E. Baker, and Ernest E. Carter, Jr., both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 13, 1978, Ser. No. 941,753
Int. Cl.[2] E21B 33/122; F16L 35/00
U.S. Cl. 166—186 17 Claims



4. An isolation packer, comprising:
a tubular body;
an upper packer assembly, attached to said body;
a lower packer assembly, attached to said body;
a port, located between said upper and lower packer assemblies, communicating an inner cavity of said tubular body with an outer surface of said tubular body;
wherein said tubular body includes a slip joint port valve means, connected between said upper and lower packer assemblies, said valve means being moveable between a first position closing said port when a compressive axial force is applied across said tubular body, and a second position opening said port when a tensile axial force is applied across said tubular body, said valve means including:
a slip joint mandrel having said port disposed radially therethrough, said mandrel including an inverted J-shaped groove, having a long leg groove segment and a short leg groove segment with a connecting groove segment joining an upper end of said long and short leg segments and with a lower end of said long leg segment communicating with a bottom end surface of said slip joint mandrel; and
a slip joint sleeve slidingly engaging said slip joint mandrel, said sleeve including a radial bore disposed therethrough for alignment with said port when said valve is in said second open position, and including a lug constructed for insertion into the lower end of said long leg groove segment and for movement through said long leg segment and said connecting segment into said short leg segment, wherein said isolation packer further comprises;
a means for retaining said lug in said short leg groove segment, so that said lug remains in said short leg groove segment and reciprocates therein when said valve means is moved between said first and second positions.

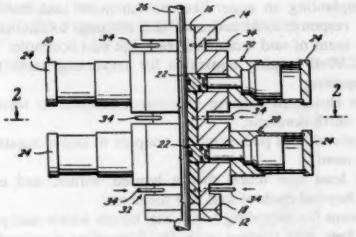
4,192,379
BLOWOUT PREVENTER AND METHOD OF INSURING PREVENTION OF FLUID LEAKS OUT OF A WELLHEAD

Alvin B. Kennedy, Jr., P.O. Box 897, Alvin, Tex. 77511

Continuation-in-part of Ser. No. 854,193, Nov. 23, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 917,916
Int. Cl.[2] E21B 33/06
U.S. Cl. 166—250 29 Claims

2. A method of insuring the prevention of fluid leaks out of a well, comprising the steps of:
installing a blowout preventer at the wellhead, said blowout preventer having a body with a bore for communicating with the bore hole of a well, clamping means mounted with the body for keeping the fluid pressure within the bore hole, sealant directing means at the wellhead for directing sealant into the bore below the clamping means and sealant passage means in said body with outlets below and above said clamping means;
sensing the occurrence of a blowout in the well;
closing the clamping means in response to the sensed occurrence to seal the fluid pressure within the well; and
injecting a sealant through the sealant directing means into the bore so that the sealant will be carried to the closed clamping means by any fluids leaking past the closed clamping means, a seal being formed by such sealant at said clamping means to insure that fluids do not leak out of the well.

13. A blowout preventer used at a wellhead, comprising:
a body with a bore therethrough; means mounted with said body for coupling said body to the wellhead with the bore in communication with a borehole;
clamping means mounted with said body for clamping against pipe extending through said bore and controlling the passage of fluids through the bore by moving from an opened position where said clamping means is retracted to a closed position where said clamping means is in clamping and sealing engagement with said pipe;



means mounted with said body for directing sealant into the bore above the wellhead and below said clamping means, a sealant injected through said directing means is carried by fluid flowing up the bore to the clamping means and enhances the seal of said clamping means when the clamping means are closed and thereby insures that fluid does not leak past the closed clamping means.

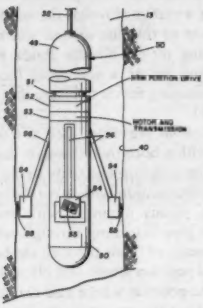
18. A wellhead assembly for insuring the prevention of leaks out of a well, comprising:
a blowout preventer for sealing the fluid pressure within a borehole of the well, said preventer including a body with a bore in communication with the borehole and clamping means mounted with the body for sealing the fluid pressure within the borehole when a blowout is sensed; and
means mounted in said body beneath said clamping means of said blowout preventer for directing sealant into the bore of said blowout preventer below said clamping means when the clamping means move to a closed position to seal the fluid pressure within the borehole, the sealant being carried by leaking fluids up to the bore to the closed clamping means and cooperating with said clamping means to enhance the seal of said clamping means to insure that the fluids do not leak out of the well.

4,192,380

METHOD AND APPARATUS FOR LOGGING INCLINED EARTH BOREHOLES

John R. E. Smith, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 2, 1978, Ser. No. 947,680
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—250 **11 Claims**



1. A method of logging formations surrounding an earth boreholes, comprising the steps of:

causing a well logging instrument to traverse an earth borehole by gravitational force;

detecting stoppage of said instrument within said borehole;

implanting an auger-like movement to said instrument in response to detection of said stoppage to facilitate movement of said instrument through said borehole.

3. Well logging apparatus for traversing earth borehole, comprising:

an elongated logging instrument adapted to traverse said earth borehole;

a plurality of pad members coupled to said elongated instrument;

at least one wheel means housed within, and extending beyond each of said pad members;

means for extending said wheel means within said pad members into contact with the formations surrounding said earth borehole; and

activatable means within said logging instrument for facilitating movement of said logging instrument through said inclined portions of said borehole.

4,192,381

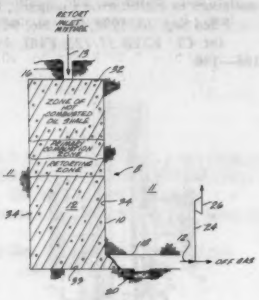
IN SITU RETORTING WITH HIGH TEMPERATURE OXYGEN SUPPLYING GAS

Chang Y. Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 815,255, Jul. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 796,696, May 13, 1977, Pat. No. 4,089,375, which is a continuation-in-part of Ser. No. 615,558, Sep. 22, 1975, Pat. No. 4,036,299, which is a continuation-in-part of Ser. No. 492,289, Jul. 26, 1974, abandoned. This application Nov. 28, 1978, Ser. No. 964,146
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—261 **29 Claims**

1. In a method for retorting oil shale in an in situ oil shale retort having boundaries of unfragmented formation, the retort containing a fragmented permeable mass of particles containing oil shale and having a combustion zone advancing therethrough and having a retorting zone on the advancing side of the combustion zone, where a retort inlet mixture comprising oxygen is introduced into the retort on the trailing side of the combustion zone and liquid and gaseous products are produced in the retorting zone, the improvement comprising:

introducing the retort inlet mixture at a temperature of at least about 1150° F. such that at least a portion of the fragmented mass on the trailing side of the combustion



zone is maintained at a temperature of at least about 1150° F.

4,192,382

HIGH CONFORMANCE ENHANCED OIL RECOVERY PROCESS

Vernon H. Schievelbein, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 863,503, Dec. 22, 1977. This application Aug. 25, 1978, Ser. No. 936,651
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—269 **23 Claims**

1. A method of recovering petroleum from a subterranean, petroleum-containing formation, said formation containing water having a salinity of from 5000 to 240,000 parts per million total dissolved solids, said formation containing at least two distince petroleum-containing strata, the permeability of at least one stratum being at least 50 percent greater than the permeability of the other stratum, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with substantially all of the strata of said formation, comprising

(a) injecting a first aqueous surfactant-containing oil-displacing fluid into the formation via the injection well, said fluid passing through at least one of the more permeable strata of said formation and displacing oil therein toward the production well, from which it is recovered to the surface of the earth;

(b) after said first aqueous oil displacing fluid has passed through at least one of said more permeable strata to the production well, discontinuing injected said fluid and injecting an amount of petroleum into the formation sufficient to raise the average oil saturation in the portion of the more permeable strata of the formation being treated to at least ten percent;

(c) injecting water or brine to displace petroleum injected in step (b) away from the injection well and distribute it in the portion of the strata to be treated;

(d) injecting an aqueous treating liquid whose viscosity is no more than twice the viscosity of water, said liquid containing at least one surfactant which is capable of producing a stable viscous oil-in-water emulsion with the petroleum present in the zone being treated at formation temperature and at a salinity about equal to the salinity of the formation water;

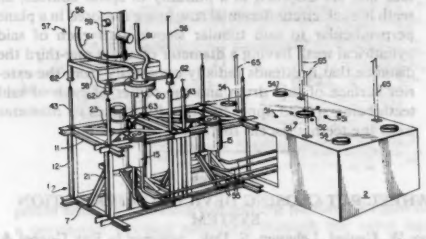
(e) thereafter injecting a second surfactant-containing, oil-displacing fluid into the formation to pass through and displace petroleum from at least one strata of the formation not depleted in step (a), and recovering oil from the formation via the production well.

4,192,383

OFFSHORE MULTIPLE WELL DRILLING AND PRODUCTION APPARATUS

Kerry G. Kirkland, Houston, and Anthony J. Masciopinto, Humble, both of Tex., assignors to Armco Inc., Middletown, Ohio

Filed May 2, 1978, Ser. No. 902,255
Int. Cl.[2] E21B *43/01*; B01D *19/00*
U.S. Cl. 166—341 **7 Claims**



1. In an underwater apparatus for use in drilling, completing and producing a plurality of wells, the combination of at least one drilling and production template module comprising

a rigid frame adapted to be installed on the floor of a body of water before the wells are drilled,

two sets of guide posts rigidly mounted on the frame in two horizontally spaced locations and extending upwardly therefrom to cooperate with guide means extending upwardly to an operational base at the surface of the body of water,

two upright tubular well-locating and casing-support devices mounted on said frame each in a predetermined location with respect to a different one of said sets of guide posts, and

two flowline connector bodies mounted on said frame, one of said flowline connector bodies occupying a first location near and spaced laterally from one of said locating and support devices, the other of said flowline connector bodies occupying a second location near and spaced laterally from the other of said locating and support devices;

a riser module rigidly secured to the frame of said at least one drilling and production module for installation therewith and comprising

a plurality of upwardly exposed riser flowline connector hubs, and

a set of guide posts fixed on the riser base module in predetermined positions relative to the riser flowline connector hubs to cooperate with guide means extending upwardly to the operational base at the surface of the body of water; and

conduit means communicating between respective ones of the flowline connector bodies of the drilling and production template and the riser flowline connector hubs.

4,192,384

SUBSEA PRODUCTION CHAMBER

David G. Croy, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 21, 1978, Ser. No. 899,000
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—356 **10 Claims**

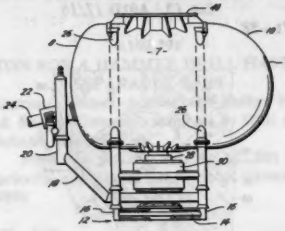
1. A subsea production chamber for location on the guide posts of a conventional subsea wellhead guide frame comprising

a vessel capable of withstanding external hydrostatic pressure,

a plurality of tubular reinforcing members secured vertically through said vessel,

said tubular members being arranged to be received over the posts of a conventional guide frame,

means for connecting said vessel to a producing well,



means for connecting said well to production flowlines, and

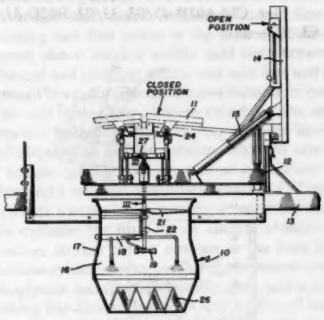
a hatch connected through said vessel to provide access to the interior of said vessel.

4,192,385

FIRE FIGHTING APPARATUS

Leo P. Pierce, Shrewsbury, Mass., assignor to Feecon Corporation, Westboro, Mass.

Filed Sep. 25, 1978, Ser. No. 945,539
Int. Cl.[2] A62C *37/00*
U.S. Cl. 169—56 **9 Claims**



1. Fire fighting apparatus, comprising:

(a) an air vent consisting of a frame adapted to be mounted on the roof of a building and of a spring-loaded door hingedly mounted on the frame for movement from a closed position to an open position,

(b) a foam generator comprising a housing mounted on the frame and carrying a manifold adapted to receive fluid and a spindle rotatably carried in the housing, the spindle carrying a turbine wheel for rotation by the fluid and a fan for forming a flow of air to mix with the fluid to form foam, the spindle having a threaded portion,

(c) a latch retaining the door in the closed position, and

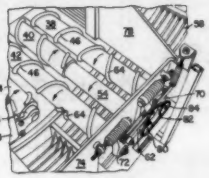
(d) a locking element that is engaged by the threaded portion of the spindle and is moved when the spindle rotates to actuate the latch and release the door, so that it moves from closed position to open position said spindle being rotated when a sensor starts the foam generator in the presence of a fire.

4,192,386

MATERIAL CONVEYOR

Virgil D. Haverdink, and Henry J. Landry, Jr., both of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 29, 1978, Ser. No. 947,182
Int. Cl.[2] A01D *17/16*
U.S. Cl. 171—58 **7 Claims**



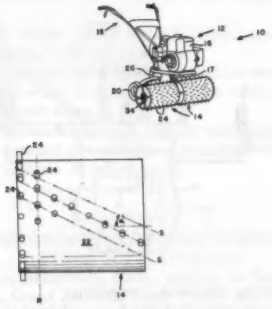
1. In a root crop harvester having a mobile frame; a root-digging means carried by the frame, an elevating means carried by the frame, and an improved conveyor means carried by the frame for receiving roots lifted by the digging means and conveying said roots towards the elevating means comprising: a pair of elongated roll means rotatable about longitudinal axes and disposed to form a root-conveying trough therebetween, one roll means including a conveying section and a discharge section, said sections mounted for rotation in opposite directions; and means for rotating the conveying section and the other roll means in opposing directions and the discharge section in the same direction as said other roll means.

4,192,387

CYLINDRICAL DRUM TILLER ATTACHMENT

Theodore W. Stinson, 615 Fairdale Ave., Bowling Green, Ky. 42101

Filed Nov. 7, 1977, Ser. No. 849,358
Int. Cl.[2] A01B *45/02, 33/02;* B62D *51/04*
U.S. Cl. 172—21 **6 Claims**



1. An attachment for a tiller controlled by an operator walking behind the tiller and comprising a horizontally disposed shaft, power means for rotating the shaft, handle means for engagement by the operator, and wheels disposed between the shaft and handle means, for supporting the tiller, said attachment comprising

a cylindrical drum having a tubular shell defining an exterior curved surface, and having a tubular sleeve disposed interiorly of and radially spaced from said tubular shell and concentric therewith, said sleeve having an interior surface adapted for engagement with the outside surface of said shaft;

detachable means for passing through said sleeve and said shaft for affixing said sleeve to said shaft for transferring rotation of said shaft to rotation of said sleeve,

means extending between said sleeve and said tubular shell for attaching said sleeve to said shell so that rotation of said sleeve effects coincident rotation of said shell while allowing access to said detachable means from a point exterior of said drum,

a plurality of substantially cylindrical teeth extending substantially linearly radially outwardly from the exterior curved surface of said drum, and

means for mounting said teeth in circumferential rows, at least three teeth in each circumferential row, so that they project radially outwardly from the curved exterior surface and are disposed in a plurality of spiral courses, all teeth in each circumferential row being disposed in a plane perpendicular to said tubular sleeve with each of said cylindrical teeth having a diameter of about one-third the distance that it extends radially outwardly from the exterior surface of said drum and the center of each of said teeth being spaced approximately four times its diameter from the teeth adjacent thereto.

4,192,388

WHEEL RUT CLOSING DEVICE FOR IRRIGATION SYSTEM

Larry W. Goebel, Lebanon, S. Dak., assignor to Ray Goebel & Sons, Inc., Lebanon, S. Dak.

Filed Mar. 8, 1978, Ser. No. 884,685
Int. Cl.[2] A01B *63/04, 37/00*
U.S. Cl. 172—463 **4 Claims**

2. In an irrigation system having an irrigation line support, said support having a horizontal bottom beam and a wheel rotatably mounted along side the rearward end of said beam, a wheel rut closing device comprising:

an implement support frame fixedly mounted at said rearward end of said beam, said frame having a rearwardly extending bottom bar, said bottom bar having fixedly attached at its rearward end a mounting bracket extending transversely behind said wheel, said frame further including a rearwardly extending top bar fixedly positioned above said bottom bar;

a rearwardly trailing implement holder, said holder being pivotally connected to said mounting bracket for pivotal movement about a generally horizontal longitudinal axis transverse to said bottom bar, said holder having a pair of generally rearwardly extending horizontally spaced arms;

a pair of circular discs for closing a rut created by said wheel, each of said discs being rotatably mounted on the rearward end of one of said arms for rotation about a longitudinal axis, so that said pair of discs are rearwardly converging and transversely spaced, whereby to force the edges of said rut toward the center thereof;

and means for varying the pivotal relation between said implement holder and said mounting bracket to vary the height of said discs relative to said beam.

4,192,389

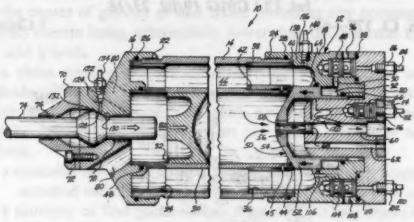
SINGLE IMPACT RIVET GUN

Rune E. B. Raman, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Aug. 2, 1978, Ser. No. 930,456
Int. Cl.[2] B23Q *5/00;* E21C *5/00*
U.S. Cl. 173—15 **8 Claims**

1. In an improved single impact rivet gun having, a cylinder, a piston movably mounted in the cylinder, and a pneumatic

accumulator to supply air pressure to force the piston against an anvil located in the working end of the cylinder and thereby form a rivet wherein the improvement comprises: the gun having openings through the working end to continually expose the working side of the piston to the atmosphere, a valve to control flow of air from the accumulator to the cylinder and with said valve located to be abutted by the back side of the



piston when the piston is in a starting position, the gun having a permanent opening extending through the valve into the cylinder to continuously communicate between the back side of the piston and the atmosphere, means for introducing air in an outward direction through the opening to create a vacuum to pull the piston into a starting position, and means for actuating the valve to introduce air from the accumulator into the cylinder to drive the piston against the anvil and set a rivet.

4,192,390

POWER TOOL

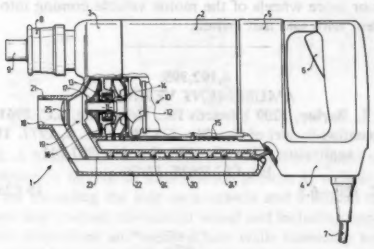
Karl Wanner, Echterdingen, and Wilbert Reibetanz, Leinfelden, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,510

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705388

Int. Cl.[2] B25D *17/14*

U.S. Cl. 173—75 **17 Claims**



1. In a power tool, which is of the type including a motor that drives a tool element of the power tool to remove particulate material from a structure and that has an output shaft, and which may be used in conjunction with an arrangement, particularly a separate arrangement that is assemblable with the power tool, that confines the removed particulate material in a confining space around the tool element, in a combination comprising a blower mounted on the output shaft of the motor for joint rotation therewith; conduit means for guiding a stream of air from the confining space to and beyond said blower, said conduit means including an elongated inlet section which has a central axis and in which a free end of the output shaft is located; means interposed in said conduit means and operative for collecting the particulate material which is entrained in said stream of air in the confining space and carried thereby through said conduit means; and intercepting means arranged in said conduit means upstream of said blower and operative for depriving the entrained particulate material at least of the greater part of the total kinetic energy possessed thereby, said intercepting means including an impact member extending radially outwardly of and substantially normal to said central axis of said inlet section, said impact member being mounted on the free end of the output shaft.

4,192,391

PISTON FOR A HAMMER DRILL HAVING A SEPARABLE PART

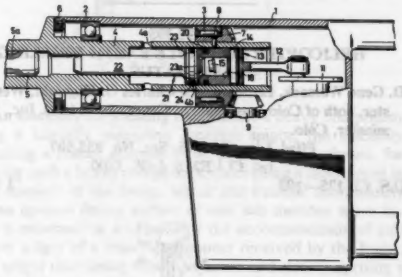
Gerhard Kastreuz, Tosters, Austria, and Volker Waschk, Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 6, 1978, Ser. No. 912,981

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729596

Int. Cl.[2] B25D *9/00*

U.S. Cl. 173—116 **13 Claims**



1. Hammer drill comprising a sleeve forming an axially extending bore having a front end and rear end, a first piston located within said bore, means connected to said first piston for reciprocating said first piston in the axial direction of the bore, a second piston located within said bore between the front end thereof and said first piston, and said first and second pistons disposed in axially spaced relation forming in combination with the said bore an air cushion therebetween, said first piston comprises walls forming a hollow cylinder having the axis thereof disposed in parallel relation with the axis of said bore, said hollow cylinder having a front end closer to said second piston and a rear end closer to the rear end of said bore, said walls include a headpiece extending across the front end of said hollow cylinder for forming an airtight closure for the hollow chamber so that the air cushion in the bore is sealed from the hollow cylinder, wherein the improvement comprises that said headpiece includes a separable part, and a predetermined breaking line formed in one of said walls and said headpiece so that said separable part separates from the remainder of said first piston when said second piston strikes against said headpiece for forming an opening between said hollow cylinder and the air cushion in the interior of said sleeve.

4,192,392

RECOVERY OF DRILLING FLUIDS

Jean-Paul Messines, Pau; Gaston Labat, Billere, and Bernard Tramier, Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Feb. 21, 1978, Ser. No. 879,225

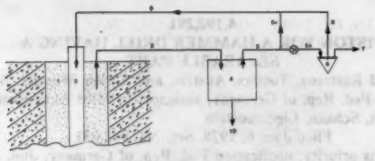
Claims priority, application France, Feb. 24, 1977, 77 05367

Int. Cl.[2] C09K *7/00*; E21B *21/00, 41/00*

U.S. Cl. 175—66 **8 Claims**

1. A process for the recovery of drilling fluid by separating the solids contained in the mud leaving the drilling well, in which the initial fluid used has a density D, the separation of the solids gives a mud of density D' which mud still contains particles of a size less than about 100 microns, a part of this

latter mud being subjected to centrifugation, the centrifugation being so controlled that said centripetal effluent has a density D_c the value of which is comprised between D and D+0.5 (D'−D) mixing the centripetal effluent with the remainder of



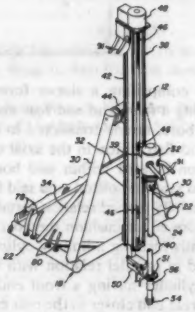
the mud D', whereby a lighter mud is formed the density D'' of which is comprised between that of the initial fluid (D) and that of the remaining mud (D') and recycling said lighter mud to the drilling well.

4,192,393

HELICOPTER PORTABLE EARTH DRILLING APPARATUS

D. Gene Womack, Littleton, and Charles G. Hignight, Westminster, both of Colo., assignors to Georex Industries, Inc., Westminster, Colo.

Filed Aug. 15, 1978, Ser. No. 933,807
Int. Cl.[2] E21B *1/08, 5/00*
U.S. Cl. 175—103 **1 Claim**



1. An air portable earth drilling apparatus comprising in combination,

a first module weighing less than 1300 lbs including a base frame having hollow tubular frame members adapted to store compressed air, and a drill rig secured to said base frame, said drill rig including a vertically oriented mast having a threaded rod extending along its length and motor means for reversibly rotating said threaded rod, a drill stem made of hollow tubing, second motor means operably connected to said threaded rod and drill stem so as to be movable vertically along said threaded rod while selectively imparting rotational movement to said drill stem, percussive type motor means connected to the lower end of said drill stem, and a drill bit operatively connected to the percussive type motor means,

a second module weighing less than 1300 lbs including a framework, compressor means and a cooling system for cooling the compressor means,

a third module weighing less than 1300 lbs including an internal combustion engine,

connection means for operably interconnecting the engine with the compressor means and the compressor means with said hollow frame members and percussive type motor means, and

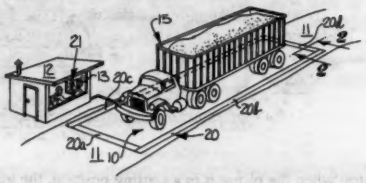
a hydraulic system on said third module, and means operably interconnecting the hydraulic system with said first mentioned and second motor means.

4,192,394

ALARM SYSTEM FOR PLATFORM SCALE

Cullie M. Simpson, Rte. 3, Marshville, N.C. 28103

Filed Jun. 26, 1978, Ser. No. 919,374
Int. Cl.[2] G01G *19/02, 23/18*
U.S. Cl. 177—45 **7 Claims**



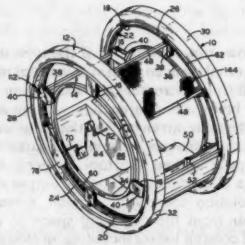
1. A platform scale of the type which includes an elongate weighing platform of a length and width adapted to accommodate a motor vehicle thereon and which is located in a surrounding roadbed to facilitate driving the motor vehicle onto the weighing platform, and in combination with said platform scale, an alarm system for alerting the operator of the scale in the event that the driver of a motor vehicle has purposefully or inadvertently positioned his vehicle with one or more of the vehicle wheels located off of the weighing platform so as to obtain a reduced tare weight when weighing, said alarm system comprising a weight responsive mat switch located in the roadbed and positioned closely surrounding all sides of the weighing platform for being engaged by the wheels of the motor vehicle when any portions of the wheels are improperly positioned and located off of the weighing platform, a signal located in the proximity of the scale operator, and means operatively interconnecting said mat switch and said signal for actuating the signal and alerting the scale operator in response to one or more wheels of the motor vehicle coming into engagement with said mat switch.

4,192,395

AMUSEMENT VEHICLE

Gerald L. Barber, 1209 Edwards Rd., Greenville, S.C. 29615

Continuation-in-part of Ser. No. 775,889, Mar. 9, 1977. This application Mar. 17, 1978, Ser. No. 887,741
Int. Cl.[2] B62K *17/00*
U.S. Cl. 180—6.5 **15 Claims**



1. A vehicle comprising:

a pair of coaxial wheels having inwardly facing annular surfaces,

a frame generally within the radial confines of said wheels extending axially between said wheels,

an inwardly extending annular support rim on the annular

surface of each of said wheels, said support rims each having an inner surface and a side surface,

a plurality of rollers means rotatable on respective horizontal axes on said frame and distributed circumferentially in the planes of and supportingly engaging the inner surfaces of said support rims so as to rotatably support said frame on said wheels,

a seat in said frame adapted for seating an occupant,

the center of gravity of said frame including any occupants seated therein being substantially lower than the common axis of said wheels,

a chain rigidly secured circumferentially to each of said wheels within the radial confines of said wheels and concentric with the common axis of said wheels, each of said chains being axially displaced from the support rim for its respective said wheel,

a rotatable sprocket engaged with each said chain, occupant actuated means drivingly connected to said sprockets, and

a plurality of first guide rollers connected to said frame for rotation about respective axes which intersect the common axis of said wheels, said rollers engaging the side surfaces of respective said support rims.

4,192,396

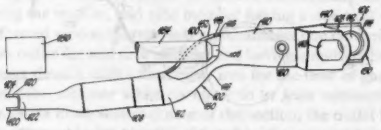
VEHICLE AXLE INCLUDING ENDWAYS OPENING AXLE END

John F. Austermann, Jr., Berkley, and Jerome E. Pack, Canton Township, Barron County, both of Mich., assignors to Lear Siegler, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 779,377, Mar. 21, 1977, abandoned. This application Jun. 27, 1977, Ser. No. 810,448

Int. Cl.[2] **B60K** *17/22, 17/30;* **B60B** *35/00*

U.S. Cl. 180—252 **24 Claims**



22. A front wheel drive unitary axle of an elongated tubular construction having an intermediate portion as well as a first end for mounting the axle on a vehicle and a second end for supporting a wheel; the second wheel end including upper and lower projections and webbed side walls extending between the projections with a thickness at least as great as the walls of the intermediate axle portion; the intermediate portion of the axle having vertically extending side walls as well as horizontally extending upper and lower walls connecting the side walls; said walls of the intermediate axle portion being of a substantially uniform thickness; a rectangular section along the intermediate axle portion defined by the upper, lower and side walls thereof immediately adjacent the wheel supporting axle end; the intermediate axle portion side walls having inward deformations forming an I-beam section immediately adjacent the rectangular section spaced from the second axle end; said inward deformations providing the I-beam section with a combined height along its side walls and width along its upper and lower walls that is less than the combined height and width of the axle at the rectangular section; a pair of abrupt horizontal bends of opposite curvature in the intermediate axle portion; and an aperture in the bend closest to the wheel supporting axle end for receiving a drive shaft that drives the wheel.

4,192,397

BATTERY LOCATING DEVICE

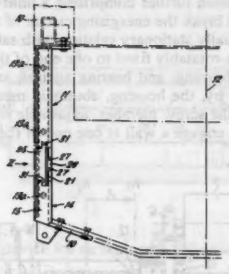
Robert J. Stroud, Reading, England, assignor to Lansing Bagnall Limited, Hampshire, England

Filed Jun. 8, 1978, Ser. No. 913,895

Claims priority, application United Kingdom, Jun. 15, 1977, 25130/77

Int. Cl.[2] **B60K** *1/04;* **B61D** *45/00;* **B65J** *1/22*

U.S. Cl. 180—68.5 **17 Claims**



1. An assembly for locating on a chassis a heavy component having a laterally extending location spigot, the assembly comprising a frame, adapted to be mounted on a chassis, for receiving such a heavy component, there being a slot formed in a side member of the frame, which slot extends downwardly from an upward facing surface of said side member when the frame is mounted on a chassis for the accommodation of said location spigot of a heavy component received by the frame, and a spigot restraining means adjacent said slot comprising a flap member which is pivotably mounted on the side member of the frame adjacent said slot for pivotal movement relative to the frame between an inoperative position in which it extends laterally outwardly of the side member of the frame and an operative position in which it covers a substantial portion of the slot, there being a recess in the flap member for accommodating the end of said location spigot of a heavy component received by said frame with its location spigot in said slot when the flap member is in its operative position, and a latch device for releasably securing the flap member to said side member of the frame when the flap member is in said operative position, the latch device being mounted on the flap member on the side of the recess therein remote from the pivotal connection between the side member of the frame and the flap member and being arranged for movement relative to the flap member to engage an adjacent portion of the side member of the frame when the flap member is in its operative position.

4,192,398

ACTUATOR MECHANISM INCORPORATING SCREW-AND-NUT DEVICES

Norman Hunt, Leamington Spa, England, assignor to Associated Engineering Limited, London, England

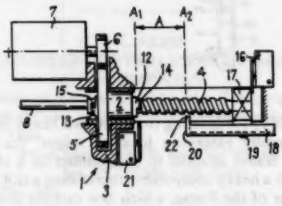
Filed Apr. 26, 1978, Ser. No. 900,239

Int. Cl.[2] **B60K** *27/00;* **F02D** *11/10;* **H01H** *3/16*

U.S. Cl. 180—178 **6 Claims**

1. A road vehicle powered by an internal combustion engine, and fitted with a speed control system including an electronic control circuit operable to sense the speed of the vehicle and produce an output which varies in dependence upon a comparison between the actual speed of the vehicle and a selected speed, said output being applied to an actuator mechanism connected to displace a speed change device of the engine, the actuator mechanism comprising a screw-and-nut device including a housing, a nut member, rotatably mounted in the housing, a screw member slidable within the housing and disposed concentrically within the nut member, the nut member being rotatably driven by a reversible electric motor controlled by the output of the control circuit, a series of balls, a

cage between the nut member and screw member and accommodating the balls, the cage having oppositely directed walls at its ends, extending in the general direction of the axis of rotation of the nut member, the balls co-operating with the cage, nut member and screw member so that rotation of the nut member produces generally axial displacement of the screw member via the balls during rotation of the cage relative to the screw member, whilst rotation of the nut member produces no axial displacement of the screw member when the cage is prevented from rotating relative to the screw member, the actuator mechanism further comprising a limit switch, operable to make and break the energising circuit of the motor, and positioned in axially stationary relation with said screw member, a block non-rotatably fixed to one end of the screw member within the housing, and bearing against, and constrained against rotation by, the housing, abutment means axially displaceable with the screw member, adjustable relative thereto, and arranged to engage a wall at one end of the cage, thereby



to prevent rotation of the cage and thus prevent axial displacement of the screw member, substantially simultaneously with actuating the limit switch, at one end of the axial travel of the screw member, the abutment means comprising a plate adjustably mounted on the block and extending in a generally axial direction towards the nut member, the plate being provided with a peg arranged to engage the wall at said one end of the cage, a further switch associated with the other end of the axial travel of the screw member, means arranged to engage a wall at the other end of the cage, thereby to prevent rotation of the cage and axial displacement of the screw member, at the other end of the axial travel of the screw member, the screw member being connected to the displaceable speed change device of the engine to effect displacement of the speed change device, and the abutment means being adjustable axially relative to the screw member to adjust and extent of the axial travel of the latter to suit the amount of travel of the engine speed change device.

4,192,399

SAFETY VACUUM VALVE AND ELECTRIC SWITCH FOR SPEED CONTROL SYSTEMS

Jack O. Otteson, and Eugene J. Martin, both of Hagerstown, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Mar. 12, 1976, Ser. No. 666,405
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—170 **8 Claims**

1. A combination vacuum valve and electric circuit switch for use with a vehicle speed control apparatus including a movable control member and a vacuum operated control system, such system requiring deactivation when said control member is moved from its normal operating position, said switch comprising:

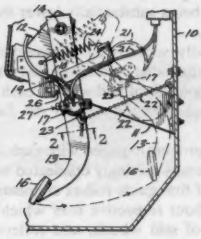
a base;

a switch lever rotatably mounted to said base and adapted to be rotated between an inoperative and an operative position;

a stationary vacuum port, adapted to be connected with such control system, adjacent said switch lever positioned to be covered by said switch lever when the switch lever rotates toward the operative position, and uncovered when the switch lever rotates away from the operative position;

a pair of electric contacts adapted to be connected with such speed control apparatus adjacent said base, and means for closing the contacts after the covering of the port as the switch lever rotates toward the operative position, and for opening the contacts before the port is uncovered as the switch lever rotates away from the operative position;

spring means mounted within said base and biasing the switch lever toward the inoperative position; and



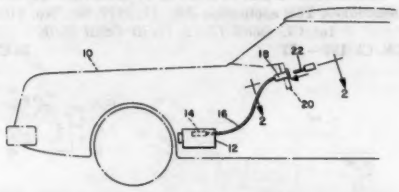
flexible cable means connected to said switch lever and adapted to be connected to such control member for rotating said switch lever to its operative position when the movable control member assumes its normal operating position.

4,192,400

JUMP-PROOF ELECTRICAL DISENABLING SYSTEM

John A. McEwan, 1808 White Oaks Dr., Alexandria, Va. 22306

Filed Feb. 9, 1978, Ser. No. 876,537
Int. Cl.[2] B60R *25/04*
U.S. Cl. 180—287 **7 Claims**



1. An anti-theft system for a protected system which has at least one essential electrical sub-system said anti-theft system comprising:

(a) an electronically controlled gate-acting element interposed in said sub-system and operable between a closed mode permitting normal operation of said sub-system and an open mode disenabling said sub-system;

(b) an electronic key and a receptacle to receive said key, said key containing a pre-determined code and being capable of reproducing said code as a coded chain of electrical pulses and delivering said chain of pulses to said receptacle;

(c) a decoder electrically coupled to said receptacle for receiving said coded chain and producing an enabling signal to said gate-acting element whereby the latter is thrown into its closed mode and said sub-system is restored to normal operating capacity;

(d) wherein said key contains a precoded shift register and said decoder includes a second shift register electrically coupled through said receptacle to said pre-coded shift register, and including an electronic clock electronically coupled to said precoded shift register through said receptacle to said second shift register to simultaneously deliver a stepping pulse to both registers to effect the shift of said

coded chain of electrical pulses from said pre-coded shift register to said second shift register.

6. A system according to claim 1 wherein said receptacle is mounted in the dashboard of a vehicle and said electronic clock and power supply are also mounted in the vehicle and electrically connected to said receptacle to make contact with said key when inserted in said receptacle.

4,192,401

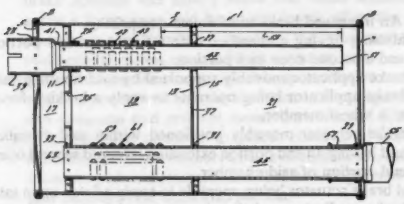
COMPLETE LOUVER FLOW MUFFLER

Don A. Deaver, Jackson, and Dale E. Sterrett, Grass Lake, both of Mich., assignors to Tenneco Inc., Deerfield, Ill.

Filed Jul. 26, 1976, Ser. No. 708,512

Int. Cl.[2] F01N *1/08, 1/02*

U.S. Cl. 181—266 **29 Claims**



1. An acoustic muffler for attenuating sound in flowing gas such as the exhaust gas from a combustion engine comprising a housing having an inlet and an outlet, an elongated substantially straight inlet tube member in said housing having an inlet opening at one end arranged to receive substantially all gas entering the muffler, said tube member having a side wall with a perforated section therein, said perforated section comprising the gas outlet for said tube member and having a multiplicity of openings therein with a total open area for the flow of gas out of the tube member which is equal to at least substantially 100% of the cross sectional area of the section, the outlet flow of gas from said tube member through said gas outlet being in a direction transverse to the inlet flow and to the length of the tube member, means cooperating with said tube member to force substantially all gas entering the tube member to leave the tube member by flowing through said gas outlet perforated section, walls connected to said housing forming an expansion chamber means containing the entire gas outlet perforated section of the tube member whereby all gas flowing out of the perforated section enters said expansion chamber means, an elongated outlet tube member arranged to receive all gas entering the muffler and deliver it to said muffler outlet, said outlet tube member having an open inlet end and having a wall with a perforated section therein, said outlet tube member perforated section being totally contained in said expansion chamber means and comprising a multiplicity of in-flow gas openings therein that are individually smaller in open area than the openings in the perforated section of the inlet tube member to thereby present a substantial resistance to cross flow from the inlet tube member through the expansion chamber means and into the outlet tube member through the perforated section in the outlet tube member, said housing walls forming a chamber into which the open inlet end of the outlet tube opens to receive gas flow from said chamber, and means for the passage of gas from said expansion chamber means into said chamber.

4,192,402

MUFFLER FOR INTERNAL COMBUSTION ENGINES

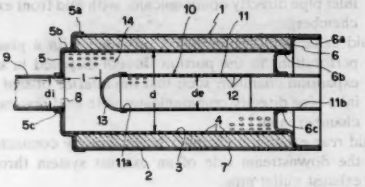
Takashi Nakagawa, Tokorozawa; Tadashi Sugiuchi, Niiza; Kanau Iwashita, Tokyo, and Masaaki Uchida, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1978, Ser. No. 908,905

Claims priority, application Japan, May 27, 1977, 52-61841; May 27, 1977, 52-61842; Jun. 6, 1977, 52-66391

Int. Cl.[2] F01N *1/24*

U.S. Cl. 181—256 **22 Claims**



1. A muffler device for an internal combustion engine, comprising:

a sealed diffusion chamber having an inlet port through which exhaust from said engine is directly introduced into said sealed diffusion chamber;

an outlet pipe extending into said sealed diffusion chamber and communicating therewith through a plurality of perforations formed in said outlet pipe;

said outlet pipe being disposed substantially concentrically and coaxially relative to said inlet port;

said outlet pipe having a front closed end disposed at a predetermined distance from and opposed to said inlet port;

said muffler being constructed to satisfy the relation $0.5 \leqq 1/di \leqq 2$, where "1" is said predetermined distance between said inlet port and said front end of said outlet pipe, and di is the diameter of said inlet port;

said muffler being further constructed to satisfy the relation $de \geqq di$, where de is the outside diameter of said outlet pipe, and di is the diameter of said inlet port; and

said inlet port having a cross section that is smaller than the cross section of said sealed diffusion chamber.

4,192,403

MUFFLER FOR INTERNAL COMBUSTION ENGINES

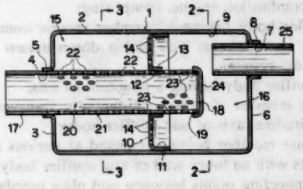
Takashi Nakagawa, Tokorozawa; Tadashi Sugiuchi, Niiza, and Kanau Iwashita, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1978, Ser. No. 908,904

Claims priority, application Japan, May 26, 1977, 52/67793[U]

Int. Cl.[2] F01N *1/08*

U.S. Cl. 181—268 **5 Claims**



1. A muffler for an internal combustion engine, comprising:

a muffler body;

a porous plate disposed within said muffler body and sectioning the interior of said muffler body into front and rear expansion chambers;

an exhaust inlet pipe extending into said front expansion chamber through a front wall of said body, said exhaust inlet pipe extending through said front expansion chamber, through said porous plate, and into said rear expansion chamber;

said exhaust inlet pipe being closed at the downstream end thereof, said closed downstream end being disposed within said rear expansion chamber;

said exhaust inlet pipe being provided with a plurality of perforations in the portion thereof disposed in said front expansion chamber, such that the interior of said exhaust inlet pipe directly communicates with said front expansion chamber;

said exhaust inlet pipe being provided with a plurality of perforations in the portion thereof disposed in said rear expansion chamber, such that the interior of said exhaust inlet pipe directly communicates with said rear expansion chamber; and

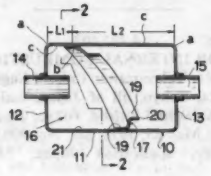
said rear expansion chamber being directly connected with the downstream side of an exhaust system through an exhaust outlet pipe.

4,192,404

MUFFLER FOR INTERNAL COMBUSTION ENGINES

Takashi Nakagawa, Tokorozawa; Tadashi Sugiuchi, Niiza, and Kanau Iwashita, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1978, Ser. No. 908,261
Claims priority, application Japan, May 25, 1977, 52/60880
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—272 **6 Claims**



1. An expansion-type muffler for an exhaust system of an internal combustion engine, comprising:

a muffler body having a chamber therein communicating with an up-stream side and a down-stream side of an exhaust system;

said muffler body having a longitudinal axis;

a plate member disposed substantially transverse to said longitudinal axis of said muffler body;

said plate member being connected at various connecting points with an inner wall of said muffler body;

said connecting points between said plate member and said inner wall of said muffler body defining a closed-loop, three-dimensional, curved surface of connection between said plate member and said inner wall; and

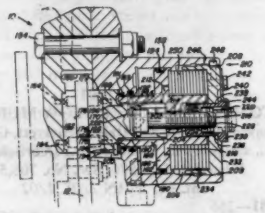
all of said connecting points are not disposed in the same plane perpendicular to said longitudinal axis of said muffler body.

4,192,405

SPRING APPLIED BRAKE MECHANISM

Arthur L. Lee, and Arthur B. Coval, both of Columbus, Ohio, assignors to A. L. Lee Corporation, Columbus, Ohio

Division of Ser. No. 819,461, Jul. 27, 1977, Pat. No. 4,138,001, which is a continuation of Ser. No. 641,941, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 508,741, Sep. 24, 1974, abandoned. This application Nov. 13, 1978, Ser. No. 960,050
Int. Cl.[2] F16D *59/02*
U.S. Cl. 188—170 **5 Claims**



1. An improved brake mechanism comprising,

a housing having a chamber with a first open end portion and a second open end portion,

a brake applicator movably supported by said housing, said brake applicator being operable to apply a braking force to a wheel member,

a brake actuator movably positioned within said chamber and having an end portion extending into said second open end portion of said chamber,

said brake actuator being operable to apply a force upon said brake applicator and thereby urge said brake applicator into braking engagement with the wheel member,

seal means surrounding said end portion of said brake actuator for sealing said second open end portion of said chamber,

said chamber being adapted to receive pressurized fluid from a source to overcome the force applied by said brake actuator,

a first annular member positioned in said chamber in abutting relation with said brake actuator,

an axial bore in said first annular member,

a second annular member positioned in said chamber and closing said first open end portion of said chamber,

an axial bore in said second annular member,

a rod member extending through said axial bores of said first and second annular members,

said rod member having a portion extending through said axial bore of said first annular member and a portion positioned within said axial bore of said second annular member,

said rod member having a first enlarged member on a first end portion thereof for movement in said axial bore of said second annular member,

said brake actuator having an axial bore,

said brake applicator having a tubular body portion and an enlarged end portion, said tubular body portion extending into said brake actuator axial bore,

said tubular portion of said brake applicator having a bore therein and a pair of opposed longitudinal slots,

said rod member having a second enlarged member on a second end portion thereof for movement in said brake applicator axial bore,

said second enlarged member of said rod member having a pin member extending therethrough and into said slots of said brake applicator tubular body portion,

said pin member arranged to non-rotatably position said rod member in said brake applicator tubular body portion bore and move longitudinally in said slots,

a retractor member positioned in said bore of said second

annular member, a bore extending through said retractor member,

said rod member extending through said bore of said retractor member,

said first annular member having a cylindrical body portion with a flanged end portion, said cylindrical body portion surrounding said retractor member,

said second annular member having a base portion closing said chamber first open end portion with said axial bore extending therethrough,

said second annular member having a flanged end portion extending into said chamber and threadedly secured to said housing at said chamber first open end portion,

resilient means positioned between said first and second annular members and having opposite end portions positioned in abutting relation with said first and second annular members respectively,

said resilient means having one end portion abutting said first annular member flanged end portion and a second end portion abutting said second annular member base portion,

said resilient means being operable to exert a preselected spring force through said first annular member upon said brake actuator and axially move said brake actuator to apply a force upon said brake applicator when the fluid pressure in said chamber is less than the force exerted by said resilient means on said brake actuator, and

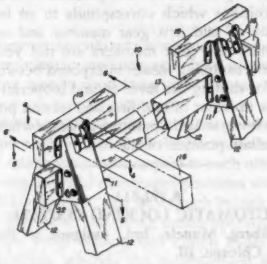
said retractor member being operable upon rotation to move said first and second annular members in abutting relation and compress said resilient means between said first and second annular members to permit removal of said first and second annular members, said resilient means, said rod member, and said retractor member as a single unit from said chamber first open end portion.

4,192,406

SAW HORSE BRACE

John R. Mitchell, 6300 Sherman St., Philadelphia, Pa. 19144

Filed Oct. 11, 1978, Ser. No. 950,305
Int. Cl.[2] F16M *11/00*
U.S. Cl. 182—185 **9 Claims**



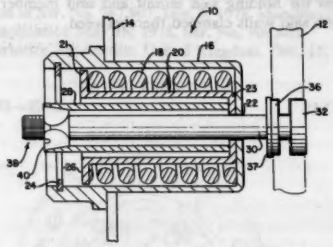
1. A saw horse brace comprising a pair of facing spaced side walls, a pair of spaced upwardly convergent end walls extending between said side walls for conforming reception there within of a pair of downwardly diverging legs, said side walls having aligned through openings for passage therethrough of a cross member between the upper ends the legs, and four corner pieces upstanding from the junctures of said side and end walls, said corner pieces combining to define pairs of aligned notches for receiving additional cross members.

4,192,407

BRAKE ADJUSTER WITH INTERNAL SWAGE

Richard L. Crossman, Tallmadge, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 14, 1978, Ser. No. 933,338
Int. Cl.[2] F16D *65/54*
U.S. Cl. 188—196 R **16 Claims**



1. In a braking system including a brake housing and a pressure plate, the improvement, comprising:

a casing connected to the brake housing;

reciprocating means maintained within said casing for reciprocating movement between first and second ends of said casing;

a tubular member, having first and second ends, in engagement at said first end thereof with said reciprocating means;

a shaft passing through said tubular member, one end of said shaft passing through an opening in said casing and being secured to the pressure plate; and

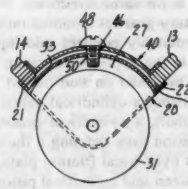
an enlarged portion connected to the other end of said shaft and in reshaping engagement with the inside circumference of said second end of said tubular member, said enlarged portion having a perimeter substantially equal to the inside circumference of said tubular member, said enlarged portion and said tubular member having different cross-sectional geometric configurations whereby passage of said enlarged portion through said tubular member changes the cross-sectional configuration of said tubular member without changing the inside circumference thereof.

4,192,408

WHEELED SUPPORT FOR SUITCASES AND LIKE ARTICLES

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Nov. 27, 1978, Ser. No. 964,032
Int. Cl.[2] A45C *5/14*
U.S. Cl. 190—18 A **7 Claims**



1. In a carrying article, such as a suitcase, having a pair of walls in intersecting relation defining a corner, a wheel housing for such article comprising:

an exterior wheel mount adapted to be partially received within an opening in said corner,

said mount including a faceplate formed to provide a pair of portions in intersecting planes and adapted to engage the outer surfaces of said walls respectively in face to face relationship,

a clamping member within said article and including a faceplate adapted to engage the inner surfaces of said walls in face to face relationship, and

means for holding said mount and said member together with said walls clamped therebetween.

4,192,409

CLUTCH MECHANISM FOR WINCH

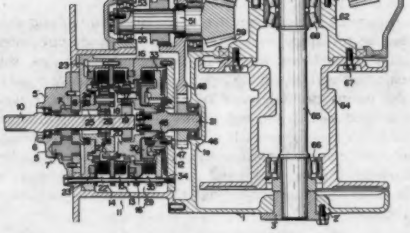
Masao Ueda, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,976

Claims priority, application Japan, Apr. 30, 1976, 51-48479

Int. Cl.[2] B60K *41/26*; F16H *57/10*

U.S. Cl. 192—4 R **5 Claims**



1. A transmission mechanism for a winch comprising:

a housing;

an input shaft rotatably supported within said housing;

an output shaft rotatably supported within said housing, the axis of said output shaft being aligned with the axis of said input shaft;

a first planetary gear set mounted on said input shaft and adapted to rotatably connect said input shaft with said output shaft in the same direction;

a second planetary gear set mounted on said input shaft and adapted to rotatably connect said input shaft with said output shaft in the opposite direction;

braking means mounted on said output shaft, said braking means comprising a cylindrical piston cage mounted on said output shaft, a cylindrical piston mounted on said cylindrical piston cage defining a fluid chamber therebetween, a first cylindrical friction plate, and spring means disposed between said cylindrical piston and said housing, said spring means being adapted to normally urge said first cylindrical friction plate toward said housing thereby locking said output shaft against rotation; and

means for selectively operating said first and second planetary gear sets by simultaneously releasing said braking means so as to transmit input rotation to said output shaft in the same or opposite direction.

4,192,410

GEARBOX COMPRISING MEANS FOR BRAKING THE INPUT SHAFT FOR ENGAGING A NON-SYNCHRONIZED SPEED

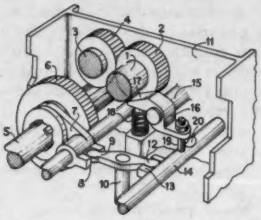
Daniel Poirier, La Garenne Colombes, France, assignor to Automobiles Peugeot, Paris, France

Filed Dec. 22, 1977, Ser. No. 863,252

Claims priority, application France, Jan. 19, 1977, 77 01447

Int. Cl.[2] B60K *41/26*

U.S. Cl. 192—4 A **8 Claims**



1. A gearbox comprising in combination, a housing, a plurality of gear means supported by the housing for producing different speed ratios of the gearbox, one of said gear means being non-synchronized gear means comprising a first gear member and a second gear member which members are relatively movable between a mutually engaged position for achieving the corresponding gear ratio and a mutually disengaged position, means supported by the housing for selecting and achieving engagement of said gear means including said non-synchronized gear means, an input shaft supported by the housing and being part of said plurality of gear means, a lever supported by the housing, means defining a braking surface and carried by the lever, the lever being pivotable between an inoperative position in which the braking surface is out of contact with the input shaft and an operative position in which the braking surface is in braking contact with the input shaft, means for shifting the lever between said inoperative and operative positions and comprising a slidable rod parallel to the input shaft and movably supported by the housing, means combining the rod with the selecting and engagement achieving means for the non-synchronized gear means for shifting the rod between a first position in which said gear members are in said mutually disengaged poisition and a second position in which said gear members are in said mutually engaged position, said rod having an intermediate position between said first and second positions which corresponds to an intermediate relative position of said first gear member and second gear member in which said gear members are not yet in mutual engagement, and camming means interposed between the rod and the lever for shifting the lever to said inoperative position when the rod is in either of said first and second positions and for shifting the lever to said operative position when the rod is in said intermediate position of the rod.

4,192,411

AUTOMATIC LOCKING CLUTCH

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

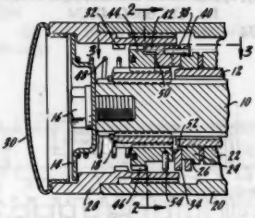
Continuation of Ser. No. 799,793, May 23, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,609

Int. Cl.[2] B60K *17/34*

U.S. Cl. 192—36 **29 Claims**

1. A clutch adaptable for effecting engagement between rotatable driving and driven members in response to rotation of the driving member, said clutch comprising first and second clutching means respectively rotatable with said driving and driven members, said first clutching means being movable relative to the driving member into and out of locking engagement with said second clutching means, means yieldably bias-

ing said first clutching means out of locking engagement with said second clutching means, rotatable cam means, and means resisting rotation of said cam means, said first clutching means defining cam follower means cooperable with said cam means for moving said first clutching means into locking engagement with said second clutching means in response to rotation of the



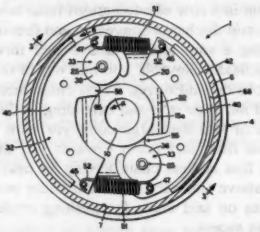
driving member, said first clutching means also defining means for rotating said cam means therewith upon effecting said locking engagement with said second clutching means, whereby said first clutching means is prevented from moving out of locking engagement with said second clutching means so long as the driving member is subject to rotation.

4,192,412

CENTRIFUGAL CLUTCH WITH SHOE STOPS

Larry L. Stoner, Massilon, Ohio, assignor to Aspro, Inc., Canton, Ohio

Filed Jun. 26, 1978, Ser. No. 918,783
Int. Cl.[2] F16D *43/18*
U.S. Cl. 192—105 CD **3 Claims**



1. In an improved centrifugal clutch construction of the type having a driven clutch member and a drive clutch rotor, said rotor including axially extending hub means, drive flange means mounted on the hub means for rotation with the hub means, pin means mounted on the drive flange means, a pair of clutch shoes pivotally mounted on the pin means and arranged in end-to-end relationship with respect to each other and movable between engaged and disengaged positions with respect to the driven clutch member, said shoes each having a web and a curved outer shoe table, and spring means operatively engaged with the clutch shoes biasing said clutch shoes toward the disengaged position, wherein the improvement includes stop means formed on each of the clutch shoe webs and engageable with the hub means when the clutch shoes are in disengaged position, said stop means being a projection formed integrally with each shoe web and extending inwardly from the shoe web toward the hub means; each of the shoe webs having an arcuate configuration formed by curved outer and inner edges which terminate in first and second end edges with opening means being formed in each of the shoe webs adjacent the first end edges for receiving the pivot pin means; and said opening means having a discontinuous circular opening greater than 180° with the stop means projections defining a portion of said opening means.

4,192,413

DRIVEN PLATES FOR FRICTION CLUTCHES

Dennis G. Rawlings, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Continuation of Ser. No. 747,907, Dec. 6, 1976, abandoned. This application May 16, 1978, Ser. No. 906,641
Claims priority, application United Kingdom, Oct. 12, 1975, 50701/75
Int. Cl.[2] F16D *3/14*
U.S. Cl. 192—106.2 **12 Claims**

1. A friction clutch driven plate which comprises a hub assembly, an annular friction facing carrier which is mounted substantially coaxially upon the hub assembly for limited rotational motion relative to the hub assembly, and resilient means which act between the annular friction facing carrier and the hub assembly to oppose rotational motion of the annular friction facing carrier in either sense of the rotation relative to the hub assembly, the resilient means comprising at least one pair of linked finger elements which are located with respect to one of the annular friction facing carrier and the hub assembly, each finger element being linked to the other finger element of the respective pair by a respective resilient link, one pair of abutments for each of said at least one pair of linked finger elements which are carried by the annular friction facing carrier and another pair of abutments for each of said at least one pair of linked finger elements which are carried by the hub assembly, both the linked finger elements of each of said at least one pair extending between the respective pair of abutments that are carried by the hub assembly and between the respective pair of abutments that are carried by the annular friction facing carrier, and the resilient link of each of said at least one pair of linked finger elements opposing deflection of either finger element of that pair towards the other finger element of that pair so that, during rotational motion of said annular friction facing carrier in either sense of rotation, the trailing one of the at least one pair of abutments that are carried by the annular friction facing carrier abuts the adjacent finger element of the respective pair of linked finger elements and deflects that finger element against the action of the respective resilient link, the other finger element of the at least one pair being held against the adjacent one of the respective pair of abutments that are carried by the hub assembly, wherein the ends of the finger elements of the at least one pair that are remote from the respective resilient link are unrestricted so that the point of contact between the trailing one of the at least one pair of abutments that are carried by the annular friction facing carrier and the finger element it abuts moves toward the respective resilitent link as it deflects that finger element whereby the reaction load applied by the finger element to the abutment that abuts it increases exponentially as that finger element is deflected, each of said at least one pair of linked

finger elements comprise a pair of tangs at each end of a coil spring, the turn or turns of the coil spring comprising the respective resilient link.

4,192,414

HYDRAULIC PRESS TOOL PROTECTION ARRANGEMENT

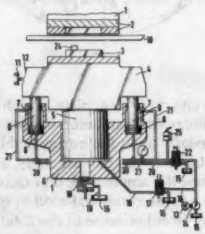
Horst Baltschun, Rulzheim, Fed. Rep. of Germany, assignor to SMG Suddeutsche Maschinenbau Gesellschaft mbH, Fed. Rep. of Germany

Filed Nov. 25, 1977, Ser. No. 854,642

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653279

Int. Cl.[2] B26D *7/24*; F16B *11/15*

U.S. Cl. 192—129 R **6 Claims**



1. An arrangement for protecting a set of tools in a hydraulic press against overloading by an object present in a tool space of the hydraulic press, the arrangement comprising a displacement switch means for monitoring at least a portion of a path of movement of a press ram in a working stroke direction and for providing an output signal indicative of a predetermined movement of the press ram, an additional switching means for providing an output signal during a movement of the press ram, and a control circuit means for evaluating a sequence of the output signals of the displacement switch means and the additional switching means in such a manner that a fault signal is generated when the additional switching means provides an output signal prior to an output signal from the displacement switch means, characterized in that at least one fast-stroke cylinder-piston means and at least one working stroke pressure means are provided for causing a displacement of the press ram in the working stroke direction with one of a piston and a cylinder of the at least one cylinder-piston means being connected to the press ram, the predetermined movement of the press ram is a movement to a position at which tools in a tool space of the hydraulic press are spaced from each other by a distance at least substantially corresponding to a thickness of a workpiece to be processed, the additional switching means includes at least one switch connected to a pressure medium supply line communicating with the fast-stroke cylinder-piston means, said at least one switch providing an output signal in dependence upon one of a pressure and speed of flow of a pressure medium in the pressure medium supply line during a displacement of the press ram in the working stroke direction at points in time prior to or at a beginning of a working of the workpiece by the tools of the hydraulic press.

4,192,415

APPARATUS FOR TRANSFERRING FROZEN CONFECTIONS FROM A SUPPLY CONVEYOR TO A DISCHARGE CONVEYOR

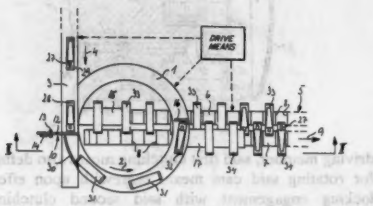
Ole G. Krener, Hojbjerg, and Ejvind Waldstrom, Beder, both of Denmark, assignors to O.G. Hoyer A/S, Hojbjerg, Denmark

Filed Apr. 4, 1978, Ser. No. 893,411

Claims priority, application Denmark, Apr. 14, 1977, 1667/77

Int. Cl.[2] B65G *47/24*

U.S. Cl. 198—374 **8 Claims**



1. Apparatus for transferring frozen confections arriving in a single row at predetermined time intervals on a supply conveyor and passing from said supply conveyor to a discharge conveyor located at a lower level than said supply conveyor, the apparatus comprising

a turret rotatable on a vertical axis and extending below said supply conveyor, means for guiding confections from said supply conveyor onto said turret along a predetermined path, first transfer means for transferring every second confection in a row of confections from said supply conveyor to said discharge conveyor, said first transfer means comprising a stop located above said turret, said stop being cyclically movable into and out of the path of the confections on said turret, a first chute means associated with said movable stop and extending in the longitudinal direction of said discharge conveyor with a downward inclination from said turret towards said discharge conveyor, a first endless chain having an operative run extending above and parallel to said chute means, and carrier means on said chain for pushing confections along said chute means,

second transfer means for transferring the remaining confections from said turret to said discharge conveyor, said second transfer means comprising a stationary stop located above said turret substantially diametrically opposite said movable stop, a second chute means associated with said stationary stop and extending in the longitudinal direction of said discharge conveyor with a downward inclination from said turret towards said discharge conveyor, a seconnd endless chain having an operative run extending above and parallel to said second chute means, and carrier means on said chain for pushing confections along said chute means,

and a common drive mechanism for effecting a continuous rotation of said turret, continuous movement of said discharge conveyor and said endless chains, and a cyclical movement of said movable stop in timed relationship with the arrival of said confections on said supply conveyor, such that said stop is maintained in the path of said confections for a period sufficient to halt one confection until it has been engaged by a carrier means on said first endless chain, while said stop is subsequently maintained outside the path of said confections for a period sufficient to permit a confection subsequently arriving on said supply conveyor to pass clear of said movable stop.

4,192,416

DEVICE FOR TRANSFERRING PIECE MATERIAL, IN PARTICULAR PIECES OF FRUIT OR VEGETABLE

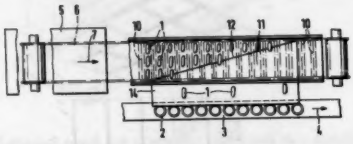
Willi Thonissen, Nettetal, Fed. Rep. of Germany, assignor to NIKO Konserven-Maschinenfabrik Hinsbek GmbH & Co., KG, Nettetal, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,506

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714594

Int. Cl.[2] B65G *47/26*; B64G *47/66*

U.S. Cl. 198—433 **4 Claims**



1. In apparatus for transferring work pieces, in particular for elongated items such as cucumbers and the like, which are transported by a conveyor from a charging station to a transfer zone extending along a conveyor section, and the work pieces being then transferred to containers placed in a row below the transfer zone, the improvement comprising:

a conveyor (6) having a plurality of parallel scrapers (10) arranged transverse to the direction of travel, said scrapers being spaced apart from one another a distance greater than the width of the work pieces, whereby the work pieces can lie between adjacent pairs of scrapers and be pushed along thereby;

said scrapers sliding on the top surface (9) of a horizontal conveyor table (8) extending from the charging station (5) to the transfer zone; and the scrapers (10) having a cross-section of increasing width toward the conveyor table surface (9);

said conveyor table having an opening (11) in the transfer zone through which the work pieces drop when said scrapers pass over the opening, said opening increasing in width along the direction of travel of the conveyor; and

means below said opening for guiding the work pieces into the containers below the transfer zone as the work pieces drop through the opening.

4,192,417

BOTTOM-BELT BUNKER FOR RECEIVING AND DELIVERING PARTICLES SERVING FOR THE MANUFACTURE OF FIBERBOARDS, CHIPBOARDS, OR THE LIKE

Berndt Greten, Springe, Fed. Rep. of Germany, assignor to Bison-Werke Bahre and Greten GmbH and Co. KG, Fed. Rep. of Germany

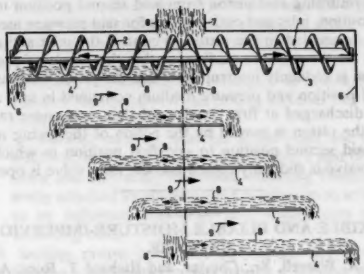
Filed Jun. 25, 1976, Ser. No. 700,023

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528391

Int. Cl.[2] B65G *47/72*

U.S. Cl. 198—601 **3 Claims**

1. Bottom-belt bunker for receiving and delivering particles serving for the manufacture of fiberboards, chipboards, or the like, and containing lignocellulose, these particles being optionally provided with binders, the bunker being located upstream of a glue applicator or in front of a forming station, characterized in that, for a pouring of uniform layers of a width corresponding to the width of the bunker, a centrally located feed opening is associated with a conventional, drivable auger arranged transversely to a longitudinal extension of the bunker, the auger having identical, mutually opposed helical flights; that a shoveling slide with an adjustable stroke is arranged underneath the auger and partially encompasses the auger, the shoveling slide having a length which is smaller than half the width of the bunker and/or half the length of the auger; that terminal positions of the reciprocating slide are located at a spacing from sidewalls of the bunker; and that an average



moving speed of the slide is approximately half as great as a conveying velocity of the helical flights.

4,192,418

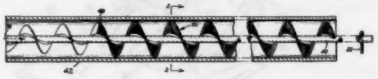
AUGER CONVEYER

Max L. Montgomery, Rte. 3, Kenton, Ohio 43326

Filed May 4, 1978, Ser. No. 902,715

Int. Cl.[2] B65G *33/26*

U.S. Cl. 198—659 **10 Claims**



1. A spiral conveyer apparatus comprising:

an elongated arbor adapted to be mounted for rotation about the arbor longitudinal axis;

a spiral comprising a plurality of spirally wound closely spaced bristles affixed to and having bristle tips extending outwardly from said arbor and adapted to carry particles from the input spiral end to the discharge spiral end upon arbor rotation; and

an elongated conveyer tube extending from the input end to the discharge end and having an interior surface spaced from the bristle tips for carrying particles from the input end to the discharge end as the arbor is rotated; said tube being substantially free of abrupt changes in diameter;

a portion of the spiral adjacent said input end being solid to thereby inhibit particle expulsion from said input end of said tube.

4,192,419

CONVEYOR

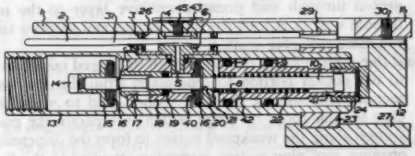
Nils H. Brodin, Hassleholm, Sweden, assignor to Henning Brodin, Olofstrom, Sweden

Filed Mar. 13, 1978, Ser. No. 886,320

Claims priority, application Sweden, Mar. 15, 1977, 7702895

Int. Cl.[2] B65G *25/00, 27/16*

U.S. Cl. 198—750 **8 Claims**



1. A conveyor comprising a frame to be anchored to a base, a piston and cylinder unit secured in said frame, a holder mounted on said frame and reciprocable by means of said piston and cylinder unit, a conveyor channel for receiving articles and for conveying said articles by said reciprocating movement, said piston being movable in said cylinder from a

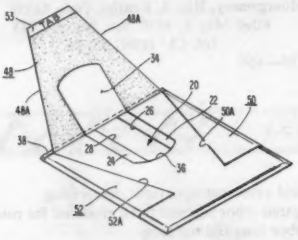
first position to a second position by pressure medium, spring means adapted to be tensioned at said movement of the piston from said first position to said second position and to contribute to returning said piston from said second position to said first position, inlet and outlet valves for said pressure medium, means connected to the piston to control the inlet and outlet valves for the pressure medium so that the supply of pressure medium is suddenly interrupted when the piston reaches said second position and pressure medium contained in said cylinder is discharged at first slowly and then ever more rapidly when the piston is moved by the action of the spring means from said second position to said first position in which the outlet valve is suddenly closed and the inlet valve is opened.

4,192,420

FLEXIBLE AND PLIABLE MOISTURE-IMPERVIOUS PACKAGE

Robert A. Worrell, Sr., Chester, and Richard T. Ross, Aston, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Nov. 30, 1978, Ser. No. 965,026
Int. Cl.[2] B65D *81/24*
U.S. Cl. 206—205 **3 Claims**



1. A flexible, moisture-impervious package for moistened webs, said package including:

three flexible layers joined together to form an integral structure, two of said layers being joined to each other about their peripheries to form top and bottom flexible walls of a pocket portion in which the moistened webs are retained;

a weakened region being provided in the top wall to define a plug section, said weakened region including spaced-apart leg sections extending forwardly from adjacent a rear sealed margin of the pocket portion, said spaced-apart leg sections providing a hinge region between them adjacent said sealed rear margin, said plug section being separable along said weakened region and movable about the hinge region to form a dispensing opening in the top wall through which the moistened webs can be dispensed; and

the third flexible layer constituting a flap section hingedly joined to the pocket portion at said sealed rear margin, said third layer including a pressure-sensitive adhesive layer on an inwardly facing surface thereof, said adhesive layer being continuous over an area that is sufficient to overlie the plug section and the top wall sections surrounding said plug section, said flap section being connected through said pressure-sensitive layer to the top flexible wall in at least the plug section and sections surrounding said plug section;

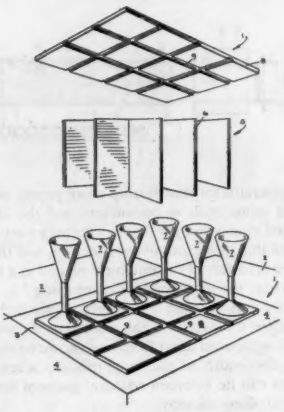
said flap section being movable about its hinged connection to the pocket portion to separate it from the top wall sections surrounding the plug section, and to move the plug section about its hinge region to separate the plug section along the weakened region to form the dispensing opening, said plug section remaining attached to the flap section through the adhesive layer and to the top wall of the pocket portion adjacent the rear sealed margin of said pocket portion, said plug section being adapted to be moved about its hinge region into overlying relationship with the dispensing opening when the flap section is removably connected to the top wall sections surrounding the dispensing opening through the pressure-sensitive adhesive layer.

4,192,421

CUSHIONING PADS FOR CARTONS

Richard K. Oglesbee, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Mar. 7, 1978, Ser. No. 884,279
Int. Cl.[2] B65D *81/06, 85/44*
U.S. Cl. 206—426 **2 Claims**



1. A package containing a plurality of relatively fragile articles having projecting extremities at one end comprising the combination of:

an outer carton with top and bottom members and side walls;

a divider contained within said carton formed of intersecting divider sheets extending from the carton top member to the carton bottom member and defining compartments;

one of said fragile articles positioned in each of the compartments;

the projecting extremities of all of said articles being adjacent to the same one of said members;

a cushioning pad positioned between said divider and said same one of said members and having a plurality of preformed intersecting grooves therein facing the other of said members and with each sheet of said divider being received in one of said grooves;

the elevated portions of the cushioning pad between the said grooves engaging the projecting extremities of the packaged articles whereby these projecting extremities are held inwardly of the divider from the divider sheet edges and are thereby completely separated from one another by the divider sheets.

4,192,422

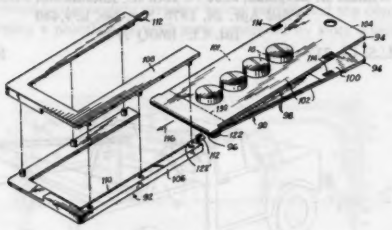
PILL PACKAGE

Bernard Kotyuk, Glendale, N.Y., assignor to Primary Design Group, Inc., New York, N.Y.

Division of Ser. No. 743,822, Nov. 22, 1976, Pat. No. 4,120,400. This application Jun. 29, 1978, Ser. No. 920,564
Int. Cl.[2] B65D *85/56*
U.S. Cl. 206—528 **3 Claims**

1. A child-proof tablet package for holding tablets comprising a blister card for enclosing said tablets and a shield having legs with ends at their furthermost extent for substantially encircling said card, said card and shield together defining positive locking means including a lock receptacle and a lock member for assuming locked and unlocked positions and said card being slidable relative to said shield when said locking

means is in an unlocked position and fixed relative to said shield when said locking means is in a locked position, said locking means including a pair of lock receptacles defined by said card and a pair of mating lock member tabs extending from said shield at said leg ends, said shield being in the form



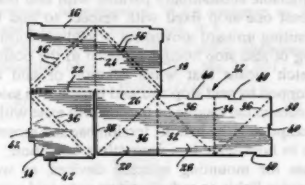
of a U-shaped track for confining said card in a slidable relationship, said tabs being at said leg ends and mating with said receptacles with said card in said track to establish a locked position and said card being flexible to enable twisting to lift one leg end and lower the other to remove said tabs from said receptacles to establish an unlocked position.

4,192,423

CORNER PAD

Vernon C. Rekow, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 6, 1978, Ser. No. 958,115
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—586 **3 Claims**



1. A blank for forming a corner pad comprising:
two upper substantially square panels connected to four lower substantially square panels, two of said square panels of said lower four square panels being connected along a score line to said upper square panels,
said uppper square panels being connected along a score line to each other, and
said two remaining lower panels being connected to each other, at least one of said two remaining panels being connected to at least one of said other lower square panels by a score line,
each of said square panels including a score line extending along a diagonal,
some of said diagonal score lines consisting of two parallel lines, and
some of the edges of at least one of said bottom panels including a notch cut.

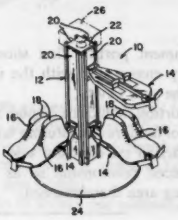
4,192,424

SHOE DISPLAY APPARATUS

Jon I. Allsop, 3157 Sunset Way, Bellingham, Wash. 98225

Filed Aug. 16, 1977, Ser. No. 825,061
Int. Cl.[2] A47F *7/08*
U.S. Cl. 211—37 **43 Claims**

1. A display apparatus particularly adapted to display articles, such as pairs of shoes, in a manner that the shoes of each pair are in an upright position and in side-by-side relationship, said apparatus comprising:
a. a mounting post having a longitudinal axis and providing at least one vertical slideway in the form of a pair of longitudinally extending opposed mounting slots,
b. at least one display unit to be mounted to said post, said unit comprising:
1. a display platform adapted to support an article, such as a pair of shoes, thereon and having an inner end and an outer end,
2. a mounting member attached to the inner end of said platform, said mounting member having a pair of oppositely and outwardly extending mounting flanges resiliently attached to the mounting member so as to be able to be deflected outwardly into engagement in said mounting slots,
3. locking means positioned to engage said mounting flanges, said locking means having a locking position where it presses said mounting flanges outwardly into



locking engagement in the mounting slots, and a release position where it releases said flanges from locking engagement in said mounting slots to permit movement of the mounting member and its associated platform relative to the mounting post,
4. a first outer securing device mounted to the outer end of the platform member by vertically-adjustable mounting means so that the outer securing device can be vertically-adjusted relative to the platform to engage in proper fashion one end of said article, such as a toe of a shoe being displayed,
5. a second inner securing device mounted to said platform at a location inwardly of the first securing device and arranged to engage an inner end of said article, such as a heel of a shoe being displayed,
whereby articles of varying sizes can be attractively displayed by adjustment of the location of the platform on the mounting post, and adjustment of the outer securing device is provided for proper engagement of the article being displayed.

4,192,425

TELEPHONE ACCESSORY

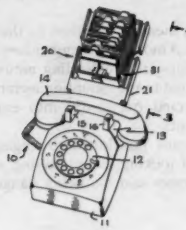
Paul H. Landau, and Harolyn S. Landau, both of 8632 W. Olympic Blvd., Los Angeles, Calif. 90035

Filed Jan. 4, 1978, Ser. No. 867,051
Int. Cl.[2] B42F *13/00*; A47F *7/00*
U.S. Cl. 211—50 **4 Claims**

1. An accessory box for a telephone having
housing and a cradle for supporting a handpiece and which is formed with a well cavity to the rear of the cradle, the combination comprising:
a support base portion;
an attachment portion carried by said base portion for insertion into the well cavity for cantilevering said base portion rearwardly and at an upwardly sloping angle;
means releasably coupling with the cradle for supporting said base in the well cavity in cooperation with said attachment portion so as to cantilever rearwardly from the cradle at an angle thereto;
accessory means carried on said base portion;

said attachment portion includes a pair of steps defining a first external shoulder insertably received within the well cavity and a second external shoulder engaging a part of the cradle and,

a pair of hollow side projections outwardly carried from opposite sides of said attachment portion adapted to receive and cover a portion of the cradle;



said attachment portion first shoulder constitutes a foot insertably engageable with the underside of said cradle within the well cavity;

said base portion includes a display area for carrying indicia;

a plurality of holders constituting writing implement support means carried on opposite sides of said base portion in fixed spaced relationship so as to define an accessory supporting area therebetween.

4,192,426

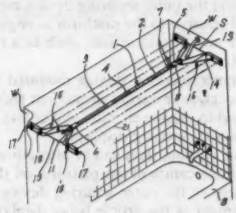
CLOTHES LINE DEVICE

Roland Gauthier, 100 Springdale Pl. Apt. 114, Dollard des Ormeaux, Quebec H9B 1N5, Canada

Filed May 10, 1978, Ser. No. 904,390

Int. Cl.[2] A47H *1/08*

U.S. Cl. 211—105.4 **6 Claims**



1. A clothes line device for mounting between opposed walls comprising an extendible stretcher unit defining a pair of opposite ends, a pair of clothes line attachment heads secured to the opposite ends respectively of said stretcher unit, each of said clothes line attachment heads including a pair of arms diverging away from the related end of said stretcher unit and a bow-shaped cross member extending transversely to said stretcher unit and secured to the outer ends of said arms, said cross member and arms forming a substantially triangular open frame for clearing a shower head extending therethrough when said cross member abuts against an adjacent wall from which the shower head protrudes, said cross-member resiliently yielding into biased engagement against the adjacent wall upon extension of said stretcher unit, each attachment head including an outer portion engaging the adjacent wall in a first position wherein said device is frictionally supported on a respective wall while allowing shifting of said device relative to the wall surface and an inner portion engaging the adjacent wall in a second position and holding said device in operative position against the adjacent wall in response to further extension of said stretcher unit.

4,192,427

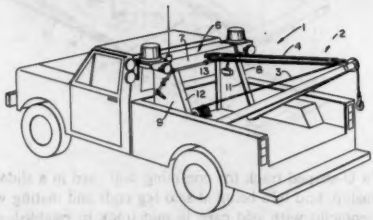
TOW TRUCK LIGHT SUPPORT

William D. Bergman, 5538 N. 25th st., Kalamazoo, Mich. 49001

Filed Apr. 24, 1978, Ser. No. 899,480

Int. Cl.[2] B60Q *1/46*

U.S. Cl. 212—8 R **5 Claims**



1. Mounting means for devices such as lights or radio antenna for a service truck, comprising:

a base plate;

a torsion bar extending along said base plate and rotatable with respect thereto;

a handle operatively associated with said torsion bar and catch means for selectively holding and releasing said handle in or from a predetermined position with respect to said base plate;

at least one mounting means, same including a platform rigidly fixed to said torsion bar and said platform being alignable substantially parallel with said base plate;

at least one stop fixed with respect to said base plate for limiting upward movement of said platform, the positioning of said stop being so related to the positioning of said catch means that when rotation of said torsion bar is stopped by said stop and said handle is in said catch means a substantial degree of tension will exist within the system comprising the handle, torsion bar and mounting means so as to hold same in a nonrattling condition;

means for mounting selected devices, as warning lights, service lights or radio antenna onto said mounting means;

whereby when said handle is positioned in said catch means, the platform of said mounting means is substantially parallel with the upper surface of said base plate and fixed with respect to said stop and said handle may be removed from said catch means and the entire system rotated to move said devices out of their raised position.

4,192,428

BOTTLE CAP

Bruno J. Segmuller, Niderfeld 766, 8260 Stein am Rhein, Switzerland

Filed Aug. 15, 1978, Ser. No. 933,885

Claims priority, application Switzerland, Aug. 16, 1977, 10173/77

Int. Cl.[2] B65D *45/32*

U.S. Cl. 215—256 **3 Claims**

1. A re-usable bottle cap adapted to reliably seal a bottle at high or low temperatures which is easily removed by hand and effectively prevents escape of liquid contents or carbon dioxide comprising:

an outer hard plastic cap member;

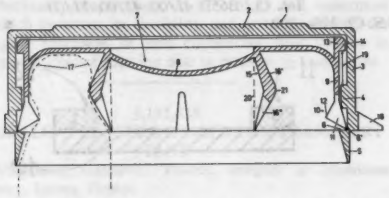
an inner flexible, soft plastic sealing insert comprising a dished top member, an inner bottle sealing member below said dished top shoulder, a cylindrical outer side wall mounted within said hard plastic cap member and tapered tongues at the side wall;

a generally cylindrical opening ring with tapered side walls

lying below and integral with the bottom edge of the side walls of said hard plastic cap member adapting the ring to fit over the shoulder of the bottle;

said taper having an inner wall sloping upwardly and inwardly from the bottom edge adapting fitting over the shoulder of the bottle;

said inner bottle sealing member below said dished top comprising a plurality of wall parts separated by slots which



are formed integrally with the walls for opening of the bottle;

said outer hard plastic cap member having an angularly projecting inner stop collar adjacent the bottom of said cap creating a recess above said opening ring for receiving the tapered tongues of the collar; and

said outer hard plastic cap member being further provided with a recess above said stop collar which permits the axial displacement of the inner sealing insert,

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4,192,429

VENTED VACUUM TUBE AND STOPPER

Arthur J. Yerman, Manahawkin, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Continuation of Ser. No. 882,807, Mar. 2, 1978, abandoned. This application Mar. 9, 1979, Ser. No. 19,007

Int. Cl.[2] B65D *51/16*

U.S. Cl. 215—307 **3 Claims**

1. A vacuum container assembly, which comprises;

(a) an air-evacuated tubular container having a first closed end and a second open end, adapted to receive in the open end a stopper having a plug portion to fit in the open end and a flange portion to sit on the edge of the open end; said container having at least one vent channel on the inner surface of the tubular container, having an open end at the edge of the container and extending from the edge of the open end to a predetermined point on the inner surface of the container distal from the open end; and

(b) a stopper mounted in the open end of the tubular container, said flange portion closing the open end of the vent channel and said plug portion closing the remaining open area of the vent channel; whereby the vent channel is sealed apart from the air-evacuated container.

4,192,430

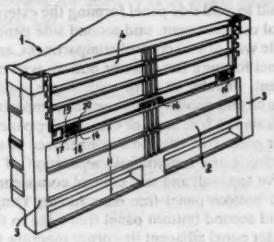
LATERALLY OPENABLE STORAGE AND TRANSPORT BOX

Jean Cornou, Verrieres le Buisson, France, assignor to Allibert Exploitation, Societe Anonyme, Grenoble, France

Filed Mar. 12, 1979, Ser. No. 19,551

Int. Cl.[2] B65D *87/00*

U.S. Cl. 220—1.5 **10 Claims**



1. A box comprising:

a floor;

a plurality of side walls extending upwardly from said floor and joined together at vertically extending corners, one of said side walls having an upper portion formed between the respective corners with a window having a lower edge and a pair of side edges;

a panel dimensioned to fit within and substantially close said window; and

at least one double-axis hinge element having a first portion journaled in said one wall adjacent said lower edge for pivoting about a first axis and having a second portion journaled in said panel for pivoting about a second axis generally parallel to and offset from said first axis, said axes being sufficiently spaced that said panel can move between a closed position flush with said one wall and blocking said window and a second position lying generally flatly against said one wall below said window.

4,192,431

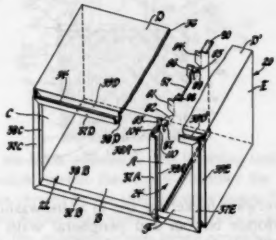
MICROWAVE OVEN SINGLE WALL CONSTRUCTION

Richard C. Brown, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 844,971, Oct. 25, 1971, abandoned. This application Jan. 9, 1979, Ser. No. 2,236

Int. Cl.[2] B65D *7/42*; H05B *9/06*; B65D *5/48*

U.S. Cl. 220—62 **3 Claims**



1. A microwave oven cabinet shell for maximizing interior volume while minimizing scrappage, said shell having side-by-side closed rectangular loop sections partially defining cooking and control compartments, the loop sections being formed from a one-piece blank presenting a divider panel, a first bottom panel, a first side panel, a top panel, a second side panel and a second bottom panel serially arranged in the order

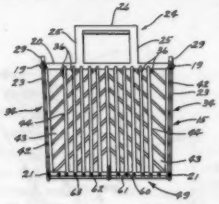
named and foldably connected at fold lines forming five corner junctures of said rectangular loop sections, said divider panel forming a common partition wall between said control compartment and said cooking compartment, said first bottom panel forming an exterior bottom wall of said cooking compartment, said first side panel forming one exterior side wall of said cooking compartment, a portion of said top panel adjacent said first side panel forming the exterior top wall of said cooking compartment, the remaining portion of said top panel adjacent said second side panel forming the exterior top wall of said control compartment, said second side panel forming the exterior side wall of said control compartment, and said second bottom panel forming the exterior bottom wall of said control compartment, thereby to form with single wall construction the cavities of said cooking and control compartments, attachment means on the free edge of said divider panel for securing said divider panel free edge to the inner face of said top panel thereby defining the longitudinal separation of said cooking compartment top wall and said control compartment top wall, said second bottom panel free edge having flange means for securing said second bottom panel free edge to the outer face of said divider panel adjacent its corner juncture with said first bottom panel, the forward edge of said blank being integrally provided with a coextensive flange, said blank flange at its associated fold lines being notched-out in a predetermined manner providing each panel with a flange portion having integral foldable opposed gussets at each free end thereof, each said flange portion being formed in section into a downwardly, forwardly and upwardly projecting channel; whereby upon the formation of the loop sections and the folding of the gussets to a common diagonal plane with respect to the corner junctures and upon securing to each other at said plane the abutting surfaces of the juxtaposed gussets on adjacent flange portions, a microwave cabinet shell is formed with maximum interior volume for any predetermined exterior dimension which has rectangular channel framed openings for the cooking compartment and the control compartment, whereby sufficient rigidity is imparted to strengthen the cabinet and support a door adapted for closing the opening for said cooking compartment.

4,192,432

SIDEWALL CONSTRUCTION FOR SILVERWARE BASKET

Lawrence J. Jordan, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Jul. 17, 1978, Ser. No. 925,091
Int. Cl.[2] B65D *7/42, 7/20*
U.S. Cl. 220—83 **2 Claims**



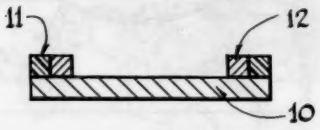
1. A silverware basket for use in a dishwashing apparatus having perforate bottom and peripheral walls wherein the improvement comprises: means for forming said peripheral walls including a plurality of generally upstanding ribs disposed in a first generally vertical plane and a plurality of downwardly sloping ribs disposed in a generally parallel second plane with said sloping ribs intersecting and connected to said upstanding ribs to form a latticework of perforations around said basket, the surfaces of said sloping ribs being free of horizontal planes and constructed and disposed for draining washing fluid from said basket whereby said latticework is substantially free of horizontal fluid supporting surfaces for minimizing the retention of said washing fluid thereon.

4,192,433

HERMETIC SEALING COVER FOR A CONTAINER FOR SEMICONDUCTOR DEVICES

Norman Hascoe, Larchmont, N.Y., assignor to Semi-Alloys, Inc., Mount Vernon, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,654
Int. Cl.[2] B65D *41/00, 43/00, 51/00*
U.S. Cl. 220—200 **9 Claims**



1. A cover unit for hermetically sealing a container for a semiconductor device comprising:

a metallic cover element;

a preformed ring of substantially chemically unreacted thermosetting plastic;

and a preformed ring of an alloy having the characteristic that it solidifies from the fluid state as a homogeneous mixture and a relatively thin oxidation-resistant coating thereon,

one of said rings being disposed substantially in registry with the periphery of the cover element and the other of said rings being nested closely inside said one ring,

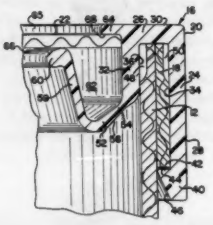
whereby, upon heating the cover unit, the two rings are fused to each other and to the cover element.

4,192,434

CONTAINER CLOSURE ASSEMBLY

Michael F. Conroy, Bridgeville, Pa., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Aug. 14, 1978, Ser. No. 933,147
Int. Cl.[2] B65D *5/64, 43/00*
U.S. Cl. 220—306 **2 Claims**



1. A closure forming arrangement for an open end of a tubular container which comprises a ring member of semi-rigid plastic material having a rim forming section with peripheral surfaces in planes generally normal to each other and having an outboard peripheral recess opening in a direction generally normal to one surface of said rim section and extending generally parallel to the other surface which outboard recess is configured to receive a marginal portion of the container wall at the open end thereof with means therein to grip said wall portion when the latter is seated in said recess, and said ring member having a recess inboard of said peripheral recess which opens in a direction to receive therein marginal portions of a closure forming disc member of paperboard or similar material with inwardly spaced means for holding the disc against movement inwardly of the container, said outboard recess extending generally parallel with an outboard peripheral

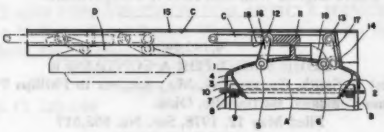
surface of said rim section and between outboard and inboard wall sections which extend generally parallel to each other and normal to a connecting wall section extending between corresponding ends of said outboard and inboard wall sections, said inboard recess being defined by the inboard surface of said inboard wall section, an overhanging extension of said connecting wall section and a wall section spaced from said overhanging extension of said wall section and extending inwardly of said inboard wall section, said wall section which extends inwardly of said inboard wall section having an area of reduced thickness intermediate its innermost and outermost edges which increases its flexibility and cooperates with the overhanging extension of said connecting wall section in clamping said closure forming disc in position in said recess.

4,192,435

SELF-SEALING CLOSURE DEVICE FOR TRANSPORT TANK

Jacky Volpeliere, Gardanne, France, assignor to Aluminum Pechiney, Lyons, France

Filed Mar. 26, 1979, Ser. No. 23,542
Claims priority, application France, Apr. 7, 1978, 78 10998
Int. Cl.[2] B65D *43/14, 51/04*
U.S. Cl. 220—331 **12 Claims**



1. A novel device for closing the dome of a tank with gravity and/or pneumatic discharge, which is self-cleaning, self-sealing, operable with a low force, capable of being automated and having a high degree of safety for the operator, comprising a closure cap member which is applied to a seat provided with a resilient sealing gasket, and a closure mechanism for holding the cap member on the seat, characterised in that the cap member comprises a protection cap provided with fixing means for the closure mechanism, and a bearing surface whose surface is a surface of revolution and which is formed by at least one segment of a straight line and/or arc of a curve, that the seat comprises a support plate acting as an abutment for the bearing surface of the cap member, a resilient gasket which is loaded in bending by contact with the bearing surface of the cap member and a co-operating flange for fixing the gasket on the support plate, and that the closure mechanism is operable with a low mechanical force.

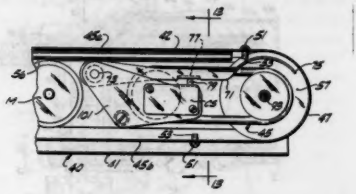
4,192,436

ARTICLE DISPENSING APPARATUS PARTICULARLY FOR USE FOR DISPENSING FOOD

James T. Schuller, and Harry C. Haeusser, both of St. Louis, Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,141
Int. Cl.[2] B65G *15/60*
U.S. Cl. 221—129 **34 Claims**

1. Article dispensing apparatus comprising:
an enclosure having a front, rear and sides;
a plurality of article dispensers in the enclosure each adapted to hold a row of articles to be vended extending in rear-to-front direction;
said dispensers being arranged in tiers with a plurality of dispensers in each tier located in side-by-side relationship in the tier;
the front ends of the dispensers being spaced rearwardly from the front of the enclosure so that there is a space between the front of the enclosure and the front ends of the dispensers;
each dispenser comprising means for feeding the respective row of articles forward and discharging the forward article off the front end of the dispenser;
a carrier extending heightwise of the tiers movable laterally with respect to the enclosure in said space;
said carrier having a plurality of article receivers, one for each tier at the level of the front of the respective tier;
said enclosure having a delivery station therein at the front thereof extending the height of the carrier to which said carrier is movable for delivery of an article on any one of said receivers; and



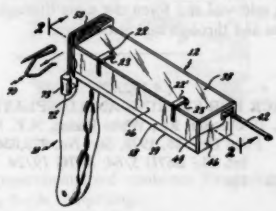
means for moving the carrier laterally with respect to the enclosure in said space to position any one of the receivers in front of the front end of any one of the dispensers in the respective tier, for operating said one dispenser to discharge the forward article off the front end of that dispenser onto said one receiver, and then moving the carrier to a delivery position at said delivery station where an article on any one of the receivers is accessible from the front of the enclosure.

4,192,437

PIN-HOOK DISPENSING AND INSERTING OR SETTING TOOL

James L. Wyatt, 32700 Coastsite Dr., Rancho Palos Verdes, Calif. 90274

Filed Feb. 27, 1978, Ser. No. 881,200
Int. Cl.[2] B65H *3/00*
U.S. Cl. 221—255 **9 Claims**



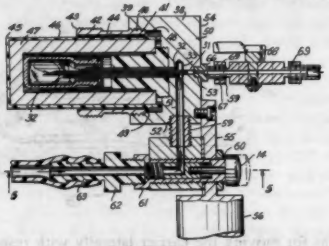
1. A drapery pin-hook dispensing and inserting tool including, in combination, means forming a chamber for holding pin-hooks, means carried by the said chamber means for ejecting individual pin-hooks to be inserted in drapery from an end of the chamber, the chamber means being provided with an opening lengthwise of the chamber of a size whereby a group of pin-hooks arranged in alignment on a spindle can be inserted into the chamber means in a position to feed to the ejector means, the chamber being free from a removable magazine part said chamber means having an internal construction contoured to conform to the shape of the pin-hooks whereby to hold and guide them in travelling toward the ejection means after removal of said spindle.

4,192,438

DEVICE FOR DELIVERING RADIOACTIVE GAS FROM A SEALED VIAL

Edward H. Foster, and James M. Reiss, both of Center Moriches, N.Y., assignors to Atomic Products Corporation, Center Moriches, N.Y.

Filed May 25, 1978, Ser. No. 909,504
Int. Cl.[2] A61B 6/00; B67B 7/24
U.S. Cl. 222—5 **3 Claims**



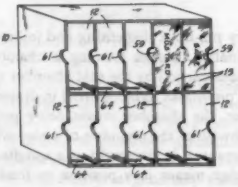
1. A device for delivering radioactive gas from a sealed vial to a gas delivery unit for performing regional ventilation studies and the like, comprising: a housing element defining an enclosed chamber and a threaded flange adjacent said chamber and defining a recess; inlet and outlet ports communicating with said enclosed chamber; a pair of concentrically disposed hollow needles extending from said enclosed chamber into said recess, one end of each of said needles disposed in said chamber communicating with one of said inlet and outlet ports; a vial receiving element positioned within said recess, and disposed in the area of opposite ends of said concentric needles; a threaded cylindrical bushing selectively engageable with said threaded flange and having means engaging a protective shielded container of a vial after the removal of a cover of said container, said engagements positioning a vial disposed within said container opposite said needles for the simultaneous penetration thereof; and coupling means connecting with said inlet port including a manually operable valve for supplying an inert gas under pressure through one of said needles into said vial; whereby upon the engagement of a vial upon said needles, and the opening of said manually operable valve, gas under pressure may be supplied through one of said needles to displace gas within said vial and force the same through the other of said needles and through said outlet port.

4,192,439

SPICE RACK FOR STORING AND DISPLAYING SPICES

Paul Segal, 15 Colonial Rd., White Plains, N.Y. 10605

Filed Dec. 26, 1978, Ser. No. 973,036
Int. Cl.[2] B67D 5/64; A47G 19/24
U.S. Cl. 222—130 **7 Claims**



1. In a spice rack:

(a) a cabinet comprising a plurality of cubicles of generally rectangular cross-section,

(b) a plurality of spice boxes for respectively fitting within said cubicles in such a way as to be removable therefrom and reinsertable therein,

(c) at least some of said spice boxes each comprising a front wall, a back wall, spaced-apart sidewalls interconnecting said front and back walls, a bottom wall, a removable top, and a partition generally parallel to said front wall dividing said spice box into a relatively large-volume dispensing compartment between said partition and said back wall and a relatively small-volume reserve compartment between said partition and said front wall, said front wall being transparent so that spice stored within said reserve compartment will be readily visible from the front of said cabinet when said spice box is located within its associated cubicle,

(d) the at least some of said spice boxes each having a generally rectangular cross-section in a plane parallel to said front wall with external dimensions in said cross-sectional plane only slightly less than the internal dimensions of the associated cubicle in said plane so that said box fits snugly within said associated cubicle,

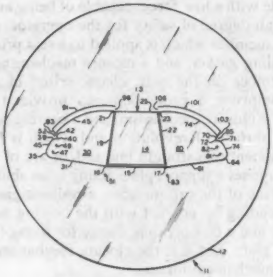
(e) and the tops of the at least some of said spice boxes each having perforations therein communicating with the associated dispensing compartment to allow spice within said dispensing compartment to be dispensed through said perforations, said tops being effectively imperforate where aligned with said reserve compartment.

4,192,440

POUR SPOUT FOR A CONTAINER

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 12, 1978, Ser. No. 905,617
Int. Cl.[2] B65D 25/44
U.S. Cl. 222—528 **9 Claims**



1. A pour spout preform structure adapted to form a pour spout comprising an inner layer member and an outer layer member:

said inner layer member having a generally C-shaped die cut therein and a first score line extending between the ends of said generally C-shaped die cut, the portion of said inner layer member outside of the area enclosed by said generally C-shaped die cut and said first score line constituting a peripheral section, the portion of said inner layer member enclosed by said generally C-shaped die cut and said first score line constituting a pour spout section, said pour spout section being integrally connected to said peripheral section along said first score line, second and third score lines being formed in said pour spout section, each of said second and third score lines extending, in such a manner that said second and third score lines never cross, from a point at least closely adjacent a respective end of said generally C-shaped die cut to a respective point on the side of said generally C-shaped die cut generally opposite the respective ends of said generally C-shaped die cut to thereby divide said pour spout section into a central chute

floor and first and second side panels, said central chute floor being integrally connected to said peripheral section along said first score line and being integrally connected to said first side panel along said second score line and to said second side panel along said third score line; said peripheral section having at least one die cut formed therein which is an arcuate strip extending generally alongside at least a part of the edge of said generally C-shaped die cut which forms the edge of said first side panel and the edge of said second side panel and which is generally opposite said first score line; and

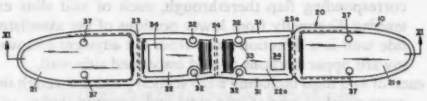
said outer layer member having a generally U-shaped die cut therein and a fourth score line formed in said outer layer member extending between the ends of said generally U-shaped die cut, the portion of said outer layer member inside the area enclosed by said generally U-shaped die cut and said fourth score line constituting a flap section and the portion of said outer layer member outside the area enclosed by said generally U-shaped die cut and said fourth score line constituting a wall section, said outer layer member being positioned against said inner layer member with said fourth score line overlying said first score line of said inner layer member and said flap section being bonded to and overlying said central chute floor.

4,192,441

CLAMP CONSTRUCTION FOR ARTICLE HANGERS

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Jul. 17, 1978, Ser. No. 925,112
Int. Cl.[2] A47J *51/14*
U.S. Cl. 223—96 **21 Claims**



1. A clamp for engaging and holding articles, said clamp having a pair of jaws hingedly joined together and spring means biasing one end of said jaws into closed, article clamping position, each of said jaws having normally divergent finger pads projecting from the hinge joint of said jaws oppositely from said one end of said jaws, said clamp characterized in that it has a pair of outer panels and a pair of inner panels, each outer panel being integral with and hingedly joined to one of said inner panels said inner panels being integral and connected to form said hinge joint between said jaws which hinge joint acts as a fulcrum about which said jaws are pivoted as said clamp is opened and closed; each of said outer panels being seated against a portion of one face of the adjacent one of said inner panels to form one of said jaws and means to secure the inner and outer panels of each jaw in abutting relationship; said inner and outer panels being moldable from plastic as a single piece.

4,192,442

ROLL SHEET DISPENSER

Lehyman J. Bastian, Media, Pa., and Richard D. Kley, New Castle, Del., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 12, 1978, Ser. No. 950,830
Int. Cl.[2] B65H *17/26*
U.S. Cl. 226—127 **8 Claims**

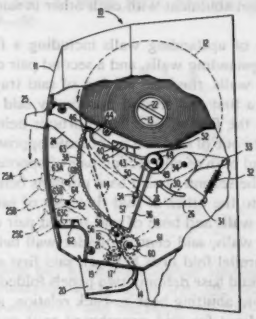
7. In a dispensing cabinet, an apparatus for feeding a sheet material through a nip formed by a rotatably mounted drive roller and a rotatably mounted pressure roller comprising:

(a) a gear segment mounted for rotation about a first point;

(b) a lever pivotally mounted about a second point;

(c) an actuator pivotally mounted about the second point, said actuator having a surface in moving contact with a portion of the gear segment, and said lever and actuator including a stop that limits the rotation of the lever with respect to the actuator;

(d) spring means for biasing the lever and actuator at the stop, so that rotation of the lever and the actuator through a given angle normally causes the gear segment to rotate through an angle greater than said given angle but when excessive force is applied to the lever and the actuator is



unable to rotate, the spring means expands to allow the lever to rotate with respect to the actuator; and

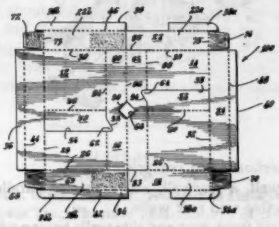
(e) gear means driven by the gear segment and operably connected to the drive roller so that rotation of the gear segment results in rotation of the drive roller whereby the sheet material is fed through the nip and dispensed from the cabinet.

4,192,443

DIVIDED PAPERBOARD TRAY

Edwin C. McLaren, Apple Valley, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 10, 1978, Ser. No. 922,813
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—28 R **3 Claims**



1. A compartmentalized container for packaging, storing and heating foods comprising:

a paperboard tray including

a horizontal base portion having a central divider wall extending upwardly therefrom substantially perpendicular thereto to form a pair of discrete food compartments on said base portion,

a plurality of upstanding walls foldably connected to said base portion,

a corner closure foldably connected to selected ones of said upstanding walls overlapping an adjacent upstanding wall and being connected thereto,

a horizontally disposed flange foldably connected to the top edge of each of said upstanding walls, each of said flanges abutting each other at their ends to form a peripheral flange,

a subdivider wall pivotally connected to said horizontal base

portion along a fold line to move from a flat to an upright position transversely within each of said discrete food compartments,

means for interlocking said subdivider walls in an upright position, said interlocking means including a substantially V-shaped notch cut in the top of said central divider wall and an ear extending from one edge of each of said subdivider walls in abutment with each other in said V-shaped notch,

said plurality of upstanding walls including a first pair of opposed, upstanding walls, and a second pair of opposed, upstanding walls, the base portion of said tray being divided into a first and second portion by said central divider wall, the first of said base portions being foldably connected to one of said first pair of said opposed upstanding walls and both of said second pair of opposed upstanding walls, the second of said base portions being foldably connected to the other of said first pair of said opposed upstanding walls and both of said second pair of opposed upstanding walls, said central divider wall being formed by three parallel fold lines between said first and second portions of said base defining two panels folded about said fold lines into abutting back-to-back relation; and

a leak proof liner for said paperboard tray comprising a preformed, semi-rigid blister of thermoformable material conforming generally to the interior of said paperboard tray, said blister being sealed to said tray at the flanges.

4,192,444

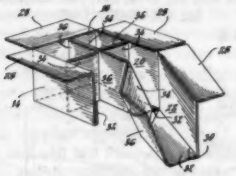
FOUR CELL BOX AND BLANK THEREFOR

Ivan E. Garmon, St. Joseph, Mo., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 947,770

Int. Cl.[2] B65D *5/48*

U.S. Cl. 229—28 R **12 Claims**



1. A paperboard box comprising:

a front wall, a rearwall, and a pair of parallel side walls connecting said rear walls,

each of said front, rear and side walls having a bottom forming flap pivotably connected to the bottom edge thereof,

each of said bottom flaps being overlapped with an adjacent one thereof,

a plurality of divider walls within the interior of said box between said side walls, each divider wall including,

at least a pair of rectangular panels, each of said panels extending essentially the entire height of said front wall, said rear wall, and said side walls, and

one of said rectangular panels being folded about a hinge line connecting it to a bottom flap within the interior of said box and each panel of each of said pair of rectangular panels being folded relative to the other into planar abutment with one of said panels in an adjacent one of said divider walls to form a plurality of cells within the interior of said box each partially defined by at least two walls, each of said last mentioned walls comprising at least two of said rectangular panels in planar abutment with each other.

4,192,445

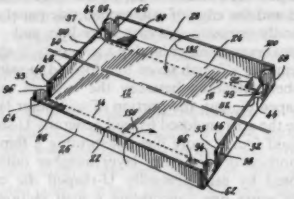
PACKAGING CONTAINER INCLUDING INTEGRAL CORNER LOCKS

David R. Card, Memphis, Tenn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 29, 1979, Ser. No. 6,991

Int. Cl.[2] B65D *5/30*

U.S. Cl. 229—35 **6 Claims**



1. A packaging container including:

a pair of opposed end walls, a pair of opposed side walls, a rectangularly shaped bottom wall and a pair of spaced apart top walls connected together to form a rectangularly shaped enclosure,

said end walls, said side walls and said top walls being interconnected adjacent each corner of said bottom wall by corner locking structure including a flap joined to each end of said top walls extending perpendicular to the latter and generally coplanar with the corresponding side walls,

said locking structure further including a slot in each of said side walls configured to receive at least a portion of the corresponding flap therethrough, each of said slots extending diagonally from lower portions of the associated side wall in a direction away from the adjacent end wall toward upper portions of said associated side wall,

each of said flaps including a tab section passing through the corresponding one of said slots and disposed within said enclosure, a triangularly shaped base section extending between the corresponding top wall and end wall and disposed exterior of said enclosure, and a tuck flap portion having one edge thereof joined along one leg of said triangular base section thereof, said tuck flap portion being disposed within said enclosure in side-by-side abutting relationship to the corresponding end wall.

4,192,446

PAPERBOARD LIQUID CONTAINER

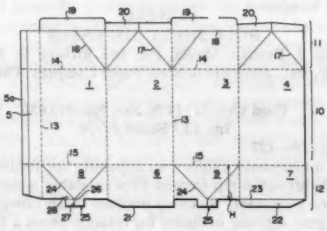
Naoki Naito, Tokyo, Japan, assignor to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,093

Claims priority, application Japan, Oct. 18, 1977, 52-139702[U]

Int. Cl.[2] B65D *5/72*

U.S. Cl. 229—37 R **2 Claims**



1. A liquid impermeable prismatically shaped paperboard comprising

four peripheral surface sheets and an adjacent piece which are disposed in a manner to be continuous in a lateral direction through fold lines;

flaps forming a lid portion and a bottom portion respectively disposed in a manner to be contiguous to upper and lower edges of said peripheral surface sheets through fold lines;

said lid flap having oblique fold lines therein, and tip pieces for joining extending from an outermost end thereof, said tip pieces being folded along fold lines extending therebetween thereby forming the lid portion in the shape of a roof;

said bottom portion including outer bottom sheets and inner bottom sheets respectively opposing each other, tip pieces disposed at tips of the opposing bottom sheets of said container bottom portion, the opposing inner bottom sheets being formed with folds in the shape of isosceles triangles whose bases are the fold lines thereof, small pieces protruding outwardly beyond outer edges of said inner bottom sheets from central parts at which exist apexes of the isosceles-triangular folds; and

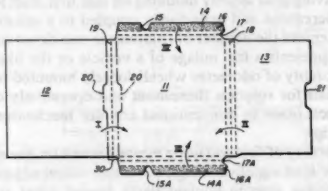
said opposing inner bottom sheets being foldable inwardly, said small pieces being insertable between the two outer bottom sheets, said tip pieces of said opposing outer bottom sheets being placeable thereon, opening parts of said paperboard thereby being joinable in a manner not exposed to the interior of said container.

4,192,447

MULTI-COMPARTMENT ENVELOPE

Ernest O. Ambrosat, and Arthur Weingartner, both of Hickory Hills, Ill., assignors to Victor Envelope Company, Elmhurst, Ill.

Filed May 1, 1978, Ser. No. 901,433
Int. Cl.² B65D 27/08
U.S. Cl. 229—72 **8 Claims**



1. A multi-compartment envelope produced from a single sheet comprising:

an adjacent single sheet thickness front and back panel formed by folding one end of said single sheet over and adjacent a portion of the remainder of said single sheet, said panels secured together at opposing side edges and open at the top by cutting off said fold between said front and back panel forming an opening to the top of a first pocket, the bottom of said front and back panel not being fastened together;

a single sheet thickness front compartment panel folded upwardly from the bottom of said back panel adjacent said front panel and open at the top forming an opening to a second pocket; and

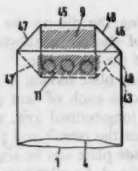
side securing means securing closed the side edges of said front compartment, front and back panels.

4,192,448

SELF-SEALING CLOSURE FOR MAILING BAGS

Erwin Porth, Wenningstedt, Fed. Rep. of Germany, assignor to "Wilhelmstal" Ernst & Sohn GmbH & Co. KG, Radevormwald, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 876,905
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1977, 2706507
Int. Cl.² B65D 27/16, 27/32, 33/20
U.S. Cl. 229—80 **5 Claims**



1. A mailing bag having a backside having an upper free edge, a frontside having an upper free edge, side creases joining said frontside to said backside and self-sealing closure comprising: a closure flap; a template flap; an inside of said closure flap; adhesive means applied in strips on said inside of said closure flap and on a portion of said backside; said template flap being folded away from contact with said adhesive means and into said mailing bag for producing a first-class letter closure with complete adhesive bonding; said template flap forming a retainer flap for securing mailing bag contents inside said mailing bag; said retainer flap together with chemical closure by bonding with said adhesive means providing mechanical security against actions of the contents on the closure flap so that said closure flap is relieved and secured against damage from the contents; auxiliary crease lines in said closure flap and in said template flap; main crease lines delimiting the lower edges of said closure and template flaps; said side creases connecting said template flap to said closure flap; said auxiliary crease lines being inclined 45° from said main crease line and extending from an intersection of said main crease line with said side creases to said upper free edge, said template flap being foldable about said main crease line both outwardly onto said backside and inwardly into said mailing bag, regions of said closure flap and of said template flap located outside said auxiliary crease lines being located in a plane underneath said backside and inside said mailing bag on an inside surface of said front side.

4,192,449

CODING SYSTEM

K. Boyd Tippetts, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jul. 3, 1978, Ser. No. 921,664
Int. Cl.² G06K 1/10
U.S. Cl. 234—111 **3 Claims**

1. A coding system for applying data by selectively piercing predetermined marking areas of a segment of a film strip, said film strip having two substantially parallel rows of sprocket holes, one row along each side of the film strip, said rows of sprocket holes being substantially uniformly spaced and parallel to one another, a predetermined number "p" of the sprocket holes of each segment being placement sprocket holes, a lead pattern located on the segment between the rows of sprocket holes, the area of the segment between the rows of the sprocket holes and the lead pattern of each segment defining the marking areas, said marking areas being divided into data blocks, comprising:

a base plate having an upper and a lower planar and parallel surfaces;

a die having upper and lower substantially planar and parallel surfaces;

means forming 2^n die pin holes through the die where "n" is an integer said die pin holes having a longitudinal axis each of which axis is substantially perpendicular to the planar surfaces of the die; there being $2^{(n-2)}$ die pin holes in each data block;

means forming "p" die pilot holes in the die, each die pilot hole having a longitudinal axis substantially perpendicular to the planar surfaces of the die, said die pin holes and die pilot holes being positioned in the die so that when the pilot holes underlie the placement sprocket holes of a segment, the data blocks of a segment overlie the die pin holes;

means for mounting the die on the base plate so that the upper surface of the die is substantially parallel to the upper surface of the base plate;

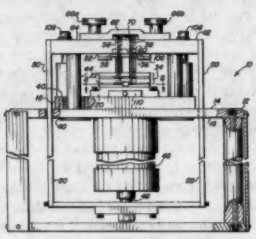
a lower punch guide plate having 2^n punch guide holes and p pilot guide holes each of said punch and pilot guide holes having a longitudinal axis, said guide holes being positioned so that the punch and pilot guide holes in the lower punch guide plate can be aligned with corresponding die pin holes and die pilot holes in the die;

means for mounting the lower punch guide plate on the die so that the longitudinal axes of the punch and pilot guide holes are substantially aligned with corresponding pin and pilot holes of the die;

a film guide channel formed in the lower punch guide plate;

a top plate having upper and lower parallel planar surfaces mounted for reciprocal linear motion with respect to the base plate;

a punch holder having upper and lower planar surfaces;



actuating means mounted on the lower surface of the base plate for moving the punch holder from a first position in which the punch holder is at a maximum distance from the base plate to a second position in which the punch holder is at a minimum distance from the base plate;

said punch holder having 2^n punch holes and p punch pilot holes each of said punch and punch pilot holes having a longitudinal axis, said punch and punch pilot holes in the punch holder being positioned so that said punch and punch pilot holes can be aligned with corresponding die pin and die pilot holes in the die;

means for mounting the punch holder on the lower surface of the top plate so that the longitudinal axis of said punch and punch pilot holes substantially coincide with the longitudinal axis of corresponding die pin and die pilot holes of the die;

a pilot pin fixedly mounted in each of the pilot holes of the punch holder;

2^n piercing punches positioned so that one is located in each of the punch holes of the punch holder for limited reciprocal movement therein; each of said piercing punches having an enlarged head;

2^n backup pin holes formed in the punch holder, each of the backup pin holes having a longitudinal axis, said backup pin holes being positioned so that the longitudinal axis of the backup pin holes substantially coincide with the longitudinal axis of the die pin holes;

a plurality of punch backup pins;

a punch backup plate removably mounted on the upper surface of the punch holder between a first position in which the backup pin holes of the punch holder are accessible and backup pins placed in said holes are free to move vertically and a second position in which each backup pin placed in a backup pin hole is held in contact with the head of a piercing punch, a backup pin when positioned in a backup pin hole in the top plate and with the backup plate in its second position, prevengint movement relative to the top place of the piercing punch whose head the backup pin contacts;

the lengths of the piercing punches and the pilots being such that they lie within the corresponding openings of the lower punch guide plate when the top plate is in its first position; and when the top plate is in its second position, the pilots project into the pilot holes of the die and each piercing punch in contact with a backup pin projects into its corresponding die, pin hole and the piercing punches not in contact with a backup pin are not forced into their corresponding pin holes.

4,192,450

ODOMETER

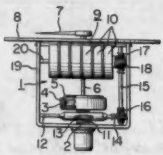
Hisao Nezu, Nagaoka, Japan, assignor to Nippon Seiki Kabishiki Kaisha, Niigata, Japan

Filed Feb. 15, 1979, Ser. No. 12,460

Claims priority, application Japan, Sep. 22, 1978, 53-130564[U]

Int. Cl.² G01C 22/00

U.S. Cl. 235—95 R **5 Claims**



1. An odometer comprising

a frame,

a first shaft unrotatably supported by said frame,

a driving gear loosely mounted on said first shaft for rotation thereabout and operatively coupled to a suitable rotating member the number of rotations in one direction of which represents a trip milage of a vehicle or the like,

a plurality of odometer wheels loosely mounted on said first shaft for rotation thereabout and operatively coupled to each other in conventional counter mechanism relationship,

a plurality of first engaging means formed on one side face of the least significant digit odometer wheel adjacent to said driving gear in equiangularly spaced apart relationship with each other and in coaxial relationship with said least significant digit wheel,

one or more second engaging means formed on said one side of said least significant digit wheel in suitably angularly spaced apart relationship with each other and in coaxial relationship with said least significant digit wheel, said one or more second engaging means being located radially inwardly of said first engaging means and spaced apart from each other radially by a suitable distance,

a driving plate mounted on said driving gear for rotation in unison therewith and formed with arcuate elastic arms which are extended concentrically in one direction and have engaging pawls formed at the free ends thereof for selective engagement with said first engaging means on said least significant digit wheel only in said one direction, and

a locking plate unrotatably mounted on or keyed to said first shaft and formed with arcuate elastic arms which are

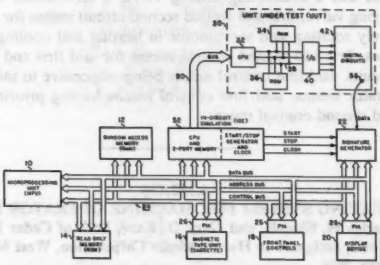
extended coaxially in one direction and have engaging pawls formed at the free ends thereof for selective engagement with said second engaging means on said least significant digit wheel only and only when the latter is rotated in the other direction, whereby when said driving gear is rotated in one direction, said driving wheel is rotated in unison therewith so that said pawls of said arcuate elastic arms of said driving wheel engage with said first engaging means on said least significant digit wheel, thereby rotating the same and its succeeding odometer wheels in said one direction while said pawls of said arcuate elastic arms of said locking plate being resilient pressed against said one side face of said least significant digit wheel but free from engagement with said second engaging means thereupon, but when said driving gear is rotated in the other direction so that said least significant digit wheel tends to rotate in said the other direction, said pawls of said arcuate elastic arms of said locking plate engage with said second engaging means on said least significant digit wheel, thereby locking the rotation in said the other direction of said least significant digit wheel, while said pawls of said arcuate elastic arms of said driving plate being resiliently pressed against said one side face of said least significant digit wheel but free from engagement with said first engaging means thereon and consequently free for rotation in said the other direction relative to said least significant digit wheel so that the rotation in the subtractive direction of said plurality of odometer wheels may be positively prevented.

4,192,451

DIGITAL DIAGNOSTIC SYSTEM EMPLOYING SIGNATURE ANALYSIS

Stephen Swerling; Steven R. Smith, both of Portland, and Thomas W. Wiesmann, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 30, 1978, Ser. No. 910,172
Int. Cl.² G06F *11/04*; G01R *31/00*
U.S. Cl. 371—20 **6 Claims**



1. An apparatus for diagnosing faults in a unit under test containing digital electronic circuits, comprising:

a signature generator connectable to preselected locations in said digital electronic circuits for receiving digital signals in the form of predetermined bit patterns generated by said unit under test, said signature generator comprising a feedback shift register which generates cyclic redundancy check character test signatures in accordance with said predetermined bit patterns and synchronous start, stop, and clock signals provided by said unit under test;

means for storing predetermined correct signatures associated with selected locations in said unit under test; and

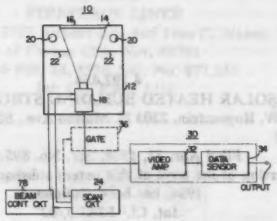
means for electronically comparing said test signatures with said predetermined signatures in a predetermined manner under program control.

4,192,452

INFORMATION READING SYSTEM

Tsutomu Hashimoto, and Nobuhiro Nakamura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 18, 1977, Ser. No. 770,074
Claims priority, application Japan, Feb. 20, 1976, 51-17744; Feb. 23, 1976, 51-18686; Mar. 15, 1976, 51-27954; Mar. 15, 1976, 51-27955; Mar. 15, 1976, 51-27956; Mar. 15, 1976, 51-27958
Int. Cl.² G06K *7/10*; H04M *5/38*
U.S. Cl. 235—471 **8 Claims**



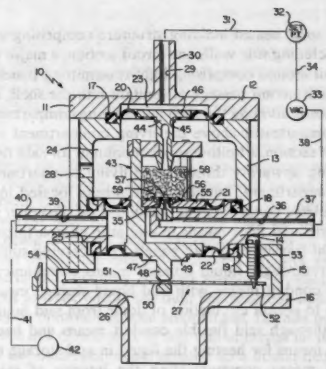
1. An information reading system comprising a pedestal including a transparent window, a television camera disposed in opposite relationship with said transparent window on said pedestal, said television camera including a focusing coil having an elliptical cross section to form an elliptical scanning beam and an output and having a raster formed of scanning lines produced therein and rotated, signal processing means connected to said output of said television camera to produce a video signal produced by said television camera, and raster control circuit means connected to the television camera for contacting each pair of adjacent scanning lines with each other.

4,192,453

THERMOSTAT CONSTRUCTION AND METHOD OF MAKING THE SAME

Alfred A. Frankenberg, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 27, 1977, Ser. No. 864,674
Int. Cl.² G05D *23/08*
U.S. Cl. 236—87 **18 Claims**



1. In a thermostat construction for producing a pneumatic signal in relation to sensed temperature and having a housing means provided with a pneumatically operated set point adjustment diaphragm operatively interconnected to a temperature sensor and a pneumatically operated feedback diaphragm

to control valve means for producing said pneumatic signal in an output chamber of said housing means that is defined in part by said feedback diaphragm, the improvement comprising a balancing diaphragm carried by said housing means and also defining in part said output chamber thereof, said balancing diaphragm being operatively interconnected to said feedback diaphragm.

4,192,454

SOLAR HEATED BUILDING STRUCTURE

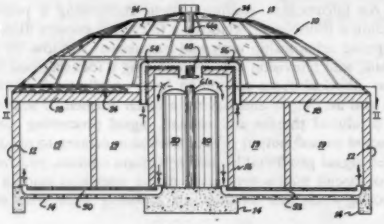
Robert W. Rugenstein, 2203 N. Malton Ave., Simi Valley, Calif. 93063

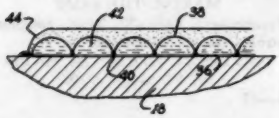
Filed Apr. 11, 1978, Ser. No. 895,499

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—427 **9 Claims**





1. A solar heated building structure comprising an exterior shell including side walls and a roof section, a major portion of said roof section comprising light-transmitting panels of material which permit passage of sunlight into the shell, horizontal floor means dividing the shell into a living compartment and an attic compartment above the living compartment and below the roof section, a hollow support column for said floor means extending upwardly through said living compartment to said attic compartment, liquid storage means located in said column, flexible conduit means positioned on the upper surface of said horizontal floor means in said attic compartment beneath said light-transmitting roof panels for receiving sunlight passing therethrough, liquid conduit means communicating said flexible conduit means with said liquid storage means in said column to permit circulation of liquir from said liquid storage means through said flexible conduit means and back to said storage means for heating the liquid in said storage means, air conduit means communicating the interior of said hollow column with said living compartment to permit circulation of air through said column to and from said living compartment, and fan means in said air conduit means for directing air over said liquid storage means in said column and to and from said living compartment to heat said living compartment.

4,192,455

APPARATUS FOR CONTROLLING THE SUPPLY TEMPERATURE IN A CENTRAL HEATING INSTALLATION

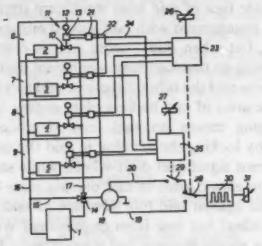
Hans C. Rasmussen, Sonderborg, and Knud J. Hallgreen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 31, 1978, Ser. No. 892,075

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714511

Int. Cl.[2] F24D *3/00*

U.S. Cl. 237—8 R **7 Claims**



1. Apparatus for controlling the heating fluid temperature in a central heating installation having at least two radiators arranged in different rooms and associated valves comprising, a thermostat assembly for each room including a thermostat having an output with first and second output signals corresponding to demand and satisfied conditions, said assembly including valve means controlled by said thermostat having open and closed states corresponding to said first and second output signals, said assembly including amplifier means connected to said thermostat output, said amplifier means having input network means which generates a rising voltage pursuant to said thermostat demand condition, comparator means connected to all of said amplifier means, said comparator means having an upper control limit for actuating said comparator means when said limit is exceeded, cool and warm sources of fluid and a connecting mixing valve, a servomotor for said mixing valve, first and second second circuit means for respectively rotating said servomotor in heating and cooling directions, first and second control means for said first and second circuits, said first control means being responsive to said comparator means, said first control means having priority over said second control means.

4,192,456

HEATING SYSTEM FOR MACHINE OPERATOR'S CAB

Charles H. Shields, and Gary D. Kane, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Aug. 21, 1978, Ser. No. 935,468

Int. Cl.[2] B60H *1/02*

U.S. Cl. 237—12.3 R **6 Claims**

1. A heating system comprising:

a hydraulic pump;

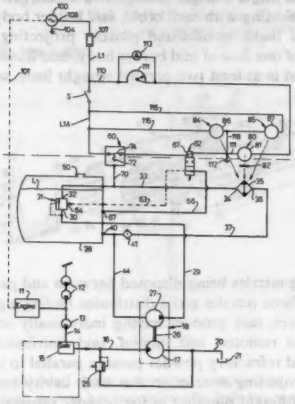
means for driving said pump;

a heat exchanger connected to said hydraulic pump;

a pressure relief valve connected between said hydraulic pump and said heat exchanger wherein hydraulic energy is converted to thermal energy as a result of a hydraulic fluid pressure drop in said pressure relief valve, said pressure relief valve being adjustable to change the fluid pressure drop therein and thereby change the hydraulic fluid temperature;

means responsive to hydraulic fluid temperature for adjust-

ing said pressure relief valve to regulate the hydraulic fluid temperature;



and a fan for directing air across said heat exchanger to effect heat transfer to said air.

4,192,457

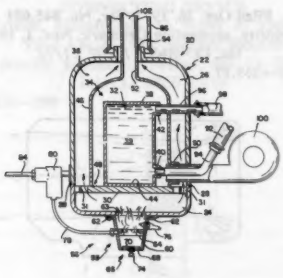
AUXILIARY TRUCK HEATER

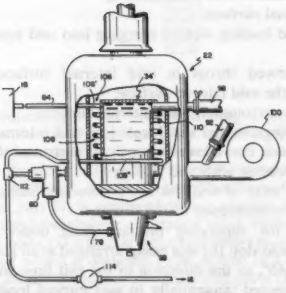
Herbert D. Easterly, P.O. Box 767, Crossville, Tenn. 38555

Filed Aug. 30, 1978, Ser. No. 938,007

Int. Cl.[2] B60H *1/02*

U.S. Cl. 237—12.3 C **17 Claims**





9. Heater apparatus comprising a housing having an upper portion which includes an exhaust port and a lower portion which includes a detachable heating means, a first heated chamber disposed within the housing for heating a fluid circulated therethrough, a second heated chamber disposed within the housing and housing the first heated chamber for heating air circulated therethrough said first and second chambers sharing a common heat conductive wall which is in direct conductive heat exchange relation with said heating means, and means disposed within the second heated chamber for heating a second fluid circulated therethrough whereby the air and second fluid are heated by heat transferred from said heating means to the second heated chamber.

4,192,458

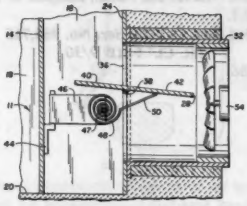
FIREPLACE LINER

Jay L. Pinnock, 2727 Airport Rd., and Ivan C. Staten, 20 Century Cir., both of Carson City, Nev. 89701

Filed Feb. 13, 1978, Ser. No. 877,142

Int. Cl.[2] F24B *1/18*

U.S. Cl. 237—51 **2 Claims**



1. An improved room heating combination of a fireplace and a liner therefor and a heat exchange chamber surrounding the fireplace from which heated air resulting from combustion is directed through a heat conveying passage into the room to be heated and wherein the heat conveying passage is connected from the heat exchanger chamber of the fireplace into which passage a connecting means is supplied to introduce also fresh unheated outer air from an external source to be heated and introduced into the room from the fireplace unit so that outside air may be heated prior to being circulated and supplied to the room, comprising, in combination,

an inlet duct for supplying fresh air from a region external to the heat exchanger chamber to be heated by the fireplace;

an outlet passage for supplying said heated outside air at controlled temperature into the region of the room;

means in the inlet duct to provide a propellant force to the intake air to direct it into the heat exchanger chamber;

a closure member within the inlet duct having a peripheral configuration and transverse size substantially corresponding to that of the interior of the inlet duct, thereby to substantially close the duct when transversely positioned thereto;

means for positioning the said closure member for pivotal movement thereof within the duct and between an open and a closed position relative to the duct by the pivotal movement thereof within the said duct, the pivot axis upon which said pivotal movement may be caused to occur being along an axis transverse to the duct length such that the closure member is divided into two unequal area parts and whereby the said member if unactivated will tend to close within the duct and whereby said member may be pivoted between an open and a closed position and when in a closed state of rest will interrupt air passage within the duct and when pivoted to a controlled open position will permit passage of controlled volumes of air through the duct and in a median position will determine the maximum air quantity passing therethrough;

a fixed position temperature control means within the passage for establishing the temperature of air passing beyond the region of the heat exchanger chamber and the region

between said heat exchanger chamber and the outlet from the air supply to mingle therewith, and

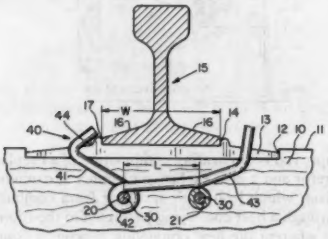
means for controlling the instantaneous position of the closure member from the said control means comprising an arm member extending from the temperature control and sensing means toward the closure member and in frictional contact engagement with the said latter member at a region within its greater area portion to move the closure member to an open position with heat increases within the heat exchanger member, thereby to admit greater air quantities thereto and to provide means to remove the frictional stress on the said closure member with temperature decreases to permit gravitational closure of the said closure member and to provide stabilized and resulting temperature control of the air supply from the fireplace to the room.

4,192,459

RAIL ANCHORING SYSTEM

Charles J. Decaro, Marshfield, Mass., assignor to Textron Inc., Providence, R.I.

Filed Nov. 8, 1978, Ser. No. 958,746
Int. Cl.[2] F01B *9/30*
U.S. Cl. 238—356 **13 Claims**



1. A rail anchoring system for securing a rail having a bottom flange to a cross-tie or the like comprising

two pins,

said pins placed in separate, transverse, horizontal bores in the cross-tie, said bores being parallel to the rail, said pins having extensions at each end exposed on both sides of the cross-tie,

two resilient clips, each comprising a hooked extension, a looped section, and a lever extension,

the said looped sections of said clips respectively passing over and pivoted upon the extension at one end of different pins on opposite sides of the cross-tie, the hooked ends bearing on the upper and outer edge surfaces of the bottom flange of the rail and the lever extensions being wedged under extensions of a pin upon which said clips are respectively not pivoted.

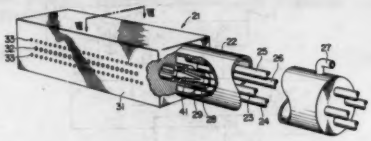
4,192,460

REFRACTORY POWDER FLAME PROJECTING APPARATUS

Masataka Matsuo, Nakama, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,771
Claims priority, application Japan, Nov. 15, 1977, 52-152317
Int. Cl.[2] B05B *1/24*
U.S. Cl. 239—79 **4 Claims**

1. A refractory powder flame projecting apparatus comprising a projecting burner body, means for supplying fuel gas, means for supplying oxygen gas, means for supplying refractory powder, said refractory powder supplying means containing an ejector for projecting the oxygen gas from said oxygen supplying means into said projecting burner body, a barrel containing a fuel gas supply pipe, an oxygen gas supply pipe and a refractory powder supply pipe extending from the corresponding supplying means, and said burner body being fixed to one end of said barrel and having a refractory powder passage, and further having a fuel gas passage and an oxygen gas passage communicating with each other, said burner body having a plurality of flame nozzles and powder projecting nozzles opening out of one face of said burner body, said flame nozzles being disposed in at least two parallel straight lines, said powder projecting nozzles being disposed between and parallel to said lines of flame nozzles and a distributor having a plurality of axial grooves, said grooves having individually separated cavities at the remotest end thereof, said distributor being inserted in said refractory powder passage parallel to the lines of powder projecting nozzles so that each cavity communicates with a different plurality of the powder projecting nozzles.

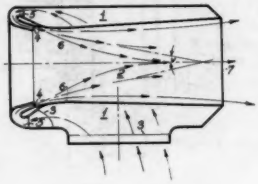


4,192,461

PROPELLING NOZZLE FOR MEANS OF TRANSPORT IN AIR OR WATER

Ole J. M. Arborg, Mordrupvej 52, DK-3060, Espergaerde, Denmark

Filed Oct. 26, 1977, Ser. No. 845,681
Claims priority, application Denmark, Nov. 1, 1976, 4930/76
Int. Cl.[2] B63H *11/02, 11/12*
U.S. Cl. 239—265.17 **6 Claims**



1. In a transport vehicle for use in air or on water, the new use of a propulsion nozzle comprising:

(a) an internal surface;

(b) a curved leading surface merging into said internal surface;

(c) a narrowed throat in said internal surface located towards the said curved surface;

(d) a jacket surrounding said internal surface;

(e) an annular internal slot located in said internal surface between said curved surface and said narrowed throat and communicating with said jacket;

(f) an inner edge of said slot not protruding inside the narrowest circumference of the throat;

(g) means for supplying primary fluid under pressure through said slot; the slot being arranged at an acute angle of under 45°, to the direction of the exit flow so that the fluid is ejected tangentially to said curved leading edge and the fluid travels with greatest speed next to the internal surface, the fluid injected through the slot being the same as the medium through which the vehicle is being propelled.

4,192,462
SHIELDED SPRAY APPARATUS

Elwyn J. Erickson, 210 6th Ave. NW., Wells, Mich. 55097

Filed Jul. 17, 1978, Ser. No. 925,387
Int. Cl.[2] B05B *1/28*
U.S. Cl. 239—288 12 Claims

1. A shielded spray apparatus comprising:
housing means having sidewalls defining a spray chamber;
said sidewalls having forward edges defining a planar front opening to the chamber positionable adjacent the surface to be sprayed;
said housing having a planar rear opening to the chamber;
a flexible panel secured to the housing and closing the rear opening;
a spray gun assembled to the flexible panel orientated to direct spray material toward and through the front opening.

4,192,463
CONNECTING DEVICE

Leif J. Yxfeldt, Fregattvägen 14, S-181 37 Lidingö, Sweden

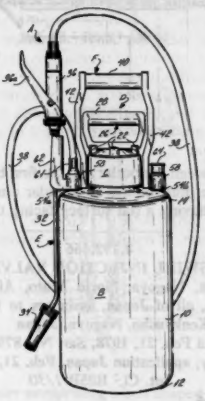
Filed Apr. 6, 1978, Ser. No. 893,830
Claims priority, application Sweden, Apr. 13, 1977, 7704242
Int. Cl.[2] B05B *15/08*
U.S. Cl. 239—289 8 Claims

1. Connecting device for connecting a water hose to an object and including at least two connecting pieces, of which one is connected to the water hose and the second to the object, characterized by the first connecting piece consisting of a hand-shower (1), in which a part (2) is formed as a handle and an other part (3) is equipped with a shower head (4), and in which the hand-shower contains a valve device (6,7,8,9) with a valve body (7) which is moveable between at least two positions and which is designed to be moved to a connected position by means of the second connecting piece (17, 21), in which the valve device is designed to allow water flow from the hand-shower (1) to the object (26) and at the same time prevent water flow out of the shower head, but in which the valve device is designed to allow water flow from the shower head when the valve body (7) is in its normal position, not influenced by the second connecting piece.

4,192,464
COMPRESSED AIR SPRAYER

Ho Chow, River Edge, N.J., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Oct. 2, 1978, Ser. No. 947,509
Int. Cl.[2] B05B *9/04;* B65D *25/28*
U.S. Cl. 239—373 19 Claims



1. In a hand-pressurized compressed air sprayer comprising:
A. a tank for holding fluid, said tank having an open top;
B. a cap removably secured to said tank to cover said open tank top;
C. a pump means operatively secured to said tank for compressing air therein, said pump means including a manually operable pump handle means extending upwardly from said cap and being movable through an operative path along a generally vertical axis extending through said cap; and
D. a handle comprising a grasping portion remote from said tank and adapted to be held by a user and a connecting portion connecting said grasping portion to said tank;
the improvement wherein said handle is movable between a first generally vertical position wherein said grasping portion extends over said cap, a second stable position wherein said grasping portion is disposed to one side of said first position of said grasping portion and laterally beyond said cap, and a third stable position wherein said grasping portion is disposed to the other side of said first position of said grasping portion and laterally beyond said operative path of said pump handle means, said handle in said first position being adapted to enable carrying of said sprayer by said handle, said handle in said second position being adapted to secure said tank against rotation without impeding removal of said cap for filling purposes, and said handle in said third position being adapted to stabilize said tank against vertical lifting or tipping without impeding movement of said pump handle means and while providing a support for the user.

4,192,465
VORTEX GENERATING DEVICE WITH EXTERNAL FLOW INTERRUPTING BODY

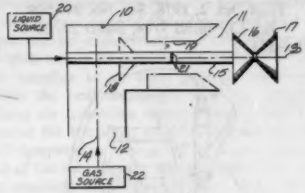
Nathaniel Hughes, 1934 Sonora Rd., Palm Springs, Calif. 92262

Continuation-in-part of Ser. No. 785,838, Apr. 8, 1977, Pat. No. 4,109,862. This application Mar. 13, 1978, Ser. No. 886,288
Int. Cl.[2] B05B *17/06;* F15C *1/16*
U.S. Cl. 239—405 63 Claims

1. A vortex generating device comprising:
a flow passage having a fluid inlet and a fluid outlet;
means for forming a vortex in fluid flowing through the passage from inlet to outlet;

a first bluff body disposed at the outlet external to the passage; and

a second bluff body disposed at the outlet external to the



passage between the outlet and the first bluff body to form between the bluff bodies an annular channel, the second bluff body having a flat surface facing the outlet.

4,192,466

SWIRL INJECTION VALVE

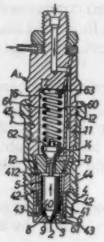
Yasusi Tanasawa, Nagoya; Norio Muto, Aichi, and Akinori Saito, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Feb. 21, 1978, Ser. No. 879,457

Claims priority, application Japan, Feb. 21, 1977, 52-18401

Int. Cl.[2] B05B *1/30*

U.S. Cl. 239—464 **23 Claims**



1. A swirl injection valve comprising

a nozzle body,

an injection port opening at an end of said nozzle body for injecting pressurized fluid,

at least one pressurized fluid induction passage provided within said nozzle body, said pressurized fluid induction passage being connectable to a pressurized fluid supply source,

a valve means having a movable member interposed into said injection port for controlling the fluid injection by on-off controlling the fuel supply to said injection port,

a swirl chamber comprising a chamber having circular cross section formed at a position adjacent to said injection port within said nozzle body, said swirl chamber being connected to said injection port, and

two tangential pressurized fluid supply passages formed within said nozzle body, which respectively open into a side wall of said swirl chamber in the tangential direction thereof at symetrically opposite portions with respect to the axis of said swirl chamber in order to form a swirl flow of said pressurized fluid within said swirl chamber,

each of said two tangential pressurized supply passages being connected to the respective one of said pressurized fluid induction passages within said nozzle body at a predetermined angle, and being formed by a hole penetrating from an outer side wall to an inner side wall forming said swirl chamber, and a plug member being inserted into said hole from said outer side wall to said connecting part of said hole and said passage,

said injection port, pressurized fluid induction passages, swirl chamber and tangential pressurized fluid supply passages being formed within said one nozzle body,

whereby the swirl flow of said pressurized fluid may be injected in a pre-determined timing determined by said valve means.

4,192,467

DOCUMENT SHREDDER

Takefumi Hatanaka, No. 276-19, Higashihiraga, Matsudo-shi, Chiba-ken, Japan

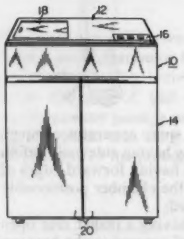
Division of Ser. No. 806,215, Jun. 13, 1977, Pat. No. 4,124,169.

This application Aug. 16, 1978, Ser. No. 934,127

Claims priority, application Japan, May 6, 1977, 52-51250

Int. Cl.[2] B02C *23/02*

U.S. Cl. 241—34 **3 Claims**



1. A document shredder for processing waste documents, comprising:

means for destroying the waste documents such that the documents are rendered unintelligible;

drive means for providing driving power to said destroying means;

a casing housing said destroying means and said drive means;

a stand-by chamber formed in said casing to temporarily keep the waste documents in a stand-by condition;

feed means for feeding at least one sheet from the waste documents kept in said stand-by chamber to said destroying means;

a cover mounted on said casing to close said stand-by chamber;

means for sensing the presence of the waste documents kept in said stand-by chamber and producing an output signal in response thereto; and

locking means responsive to said output signal for locking said cover to said casing while said waste documents are kept in said stand-by chamber.

4,192,468

FEED ROLL ASSEMBLY FOR A FORAGE HARVESTER

Allan K. Lawrence; Merlyn D. Bass; Robert D. Black, and Jerry L. Krafka, all of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 5, 1978, Ser. No. 922,029

Int. Cl.[2] B02C *18/22*

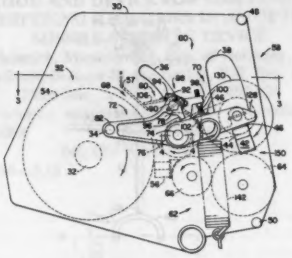
U.S. Cl. 241—101.7 **32 Claims**

1. In a forage harvester having a forward mounted harvesting unit, a cutterhead and a feeding assembly including a body and opposite generally fore-and-aft extending side walls and cooperating upper and lower conveyor assemblies for receiving crop material from the harvesting unit and conveying it rearwardly in a mat between the conveyor assemblies for delivery to the cutterhead, the upper conveyor assembly comprising:

a pair of opposite radius arms, each arm extending fore-and-aft adjacent an opposite side wall and supported by the body for pivotal movement about a transverse axis;

a first feed roll adjacent the cutterhead extending transversely between the opposite side walls and rotatably supported by and between the radius arms forward of the pivotal support of said arms;

a stiff transverse leveler shaft, resistant to torsional and bending deflection and extending between and directly and rigidly attached to the opposite radius arms external to the periphery of the first feed roll, the leveler shaft cooperating with the opposite radius arms to form a rigid



frame pivoted to the body for resisting relative rotational deflection between the radius arms and maintaining the transverse alignment of the first feed roll; and

bias means for urging the upper conveyor towards the lower conveyor assembly and compressing the mat.

4,192,469

SPRING ROLL MILL

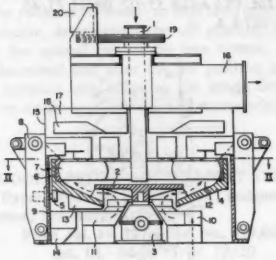
Heinz Jäger, Nevelstrasse 40, 4630 Bochum, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 880,223

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1977, 2707395

Int. Cl.[2] B02C *15/06*

U.S. Cl. 241—121 **2 Claims**



1. Spring roll mill having stationary grinding rolls yieldingly pressed from within the mill toward a circumferential grinding ring mounted on a grinding dish and revolving together therewith, a central feed inlet for supplying to the mill from above material to be ground therein, and a discharge outlet for discharging the ground material from the mill together with an air flow, comprising a distributor plate revolving together with the grinding dish, said distributor plate being disposed below the central feed inlet and below at least part of the grinding rolls for receiving thereon a supply of the material to be ground, means for centrally introducing the air flow from below said distributor plate and conducting the air flow between the grinding rolls and the grinding dish and between the grinding rolls themselves, a sifter having a centrifugal system disposed above the grinding dish, and separate means for driving the centrifugal system.

4,192,470

CUTTING DEVICE FOR THE SHREDDING OF FOODSTUFFS SUCH AS ONIONS, VEGETABLES AND FRUITS

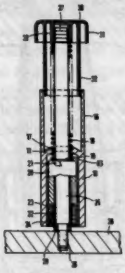
Horst Hartmann, Stuttgart, Fed. Rep. of Germany, assignor to Zyliss Zysset AG, Switzerland

Filed Jan. 18, 1978, Ser. No. 870,449

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 7702152[U]

Int. Cl.[2] B02C *18/04*

U.S. Cl. 241—169 **19 Claims**



1. A food chopper comprising a bell shaped housing having a cylindrical portion and a central neck portion, blade means locatable within the cylindrical portion of said housing and a plunger assembly extending through the neck of said housing comprising an axially movable ram attached at one end to said blade means, a handle at the other end, an outer sleeve surrounding a portion of said ram and means interposed between said sleeve and said ram for causing said ram to rotate about its axis on axial movement of said ram, said bell-shaped housing being formed of at least two separable sections divided along lines parallel to the axis of said ram and means for removably securing the outer sleeve to said housing sections, whereby said housing and said plunger assembly are separable.

4,192,471

CRUSHING APPARATUS

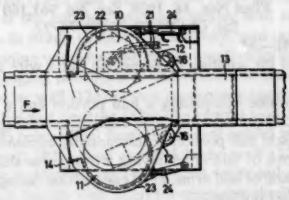
Klaus Beckman, and Richard Redemann, both of Lünen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Oct. 5, 1978, Ser. No. 948,953

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749313

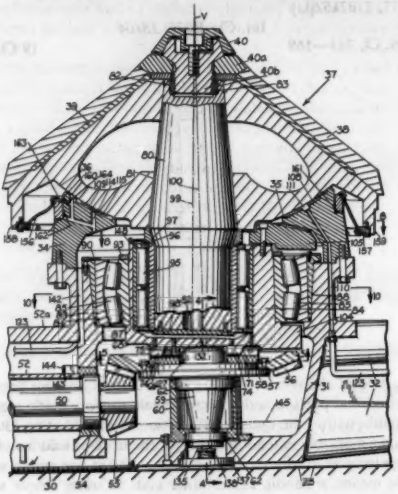
Int. Cl.[2] B02C *4/02, 4/32, 4/42*

U.S. Cl. 241—185 R **8 Claims**



1. Apparatus for crushing or breaking material, especially mineral ores; said apparatus comprising a pair of contra-rotatable generally upstanding drums for crushing material fed therebetween and a hydraulic drive motor mounted inside each drum to rotatably drive the latter.

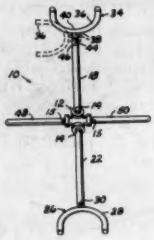
4,192,472
CONE CRUSHER
Louis W. Johnson, 345 Palomino Dr., Eugene, Oreg. 97401
Filed Apr. 17, 1978, Ser. No. 897,289
Int. Cl.[2] B02C 2/04
U.S. Cl. 241—215 **40 Claims**



35. A rock crusher comprising
(a) a base frame,
(b) a crusher head on said frame,
(c) a bowl on said frame associated with said head to form a crushing area,
(d) eccentric means operable with said head to produce gyratory movement upon rotation of said eccentric means,
(e) said eccentric means comprising a bearing assembly having inner and outer races and a middle race, said middle race having an eccentric shape,
(f) rotatable input powered drive means spaced from said eccentric means,
(g) and independent coupling means establishing a drive connection between said eccentric means and said input drive means.

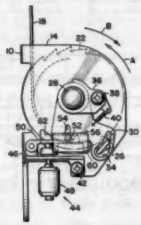
4,192,473
WIRE REEL
Gerald A. Wellman, P. O. Box 1274, Rifle, Colo. 81650
Filed Nov. 16, 1978, Ser. No. 961,160
Int. Cl.[2] B65H 75/02, 75/22
U.S. Cl. 242—84 **1 Claim**

1. A reel for winding up or paying out a wire strand, comprising:
a rigid frame comprising a hub portion and a plurality of threadedly connected arms radially extending equidistant from said hub portion in substantially coplanar relation at least one of said arms having a transverse slot, normal to the plane of said arms, in its end portion facing away from said hub portion;
first and second rigid wire bracket means centrally secured to the end portion of at least two other said arms opposite the hub portion for nesting a plurality of convolutions of wire strands when wound thereon,
said rigid wire bracket means comprising a U-shaped member forming an arcuate abutment surface facing outwardly from the respective arm in a plane normal to the plane of said arms;
a third U-shaped member;
a strap member secured to the bight portion of said third U-shaped member in the plane of the third U-shaped member and being freely received by the arm transverse slot;



means including a rivet and a removable cotter pin for securing said strap member within the slot permitting selective lateral pivoting movement of said third U-shaped member relative to the plane of said arms; and,
a pair of axially aligned rod-like handles removably projecting from opposing surfaces of said hub portion normal to the plane of said arms for manually moving said reel across the surface of the earth in a rolling wheel-like wire winding up or paying out action.

4,192,474
WEBBING RETRACTOR FOR SEATBELT SYSTEM
Mitsuo Inukai, Nagoya; Masahiro Iwatsuki, Toyoake, and Keiichi Tamura, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan
Filed Sep. 5, 1978, Ser. No. 939,421
Claims priority, application Japan, Sep. 8, 1977, 52-108391
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 A **12 Claims**



1. A webbing retractor comprising:
a take-up shaft pivotally supported on a frame for winding up the webbing for restraining an occupant;
a ratchet wheel having teeth solidly secured to said take-up shaft;
a pawl supported on the frame and adapted to be engaged with the ratchet wheel to prevent wind-out rotation of the take-up shaft when tilted;
a working plate pivotally supported on the frame and causing said pawl to tilt when rotated;
a balancer movable substantially radially of the ratchet wheel for engagement with said ratchet wheel and being rotatably coupled to and guided by said working plate; and
an acceleration detector for moving said balancer substantially radially of the ratchet wheel to engage the ratchet wheel whereby when said ratchet wheel engages with

said balancer, said balancer is caused to move by the rotation of said ratchet wheel to thereby cause said working plate to rotate and tilt said pawl into engagement with said ratchet wheel.

4,192,475

METHOD AND DEVICE FOR STOPPING OUT INTERFERING RADIATORS IN AN OPTICAL MISSILE-STEERING DEVICE

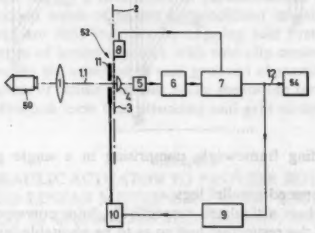
Wilhelm Heinrich, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,428

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655306

Int. Cl.[2] F41C *9/00, 3/00*

U.S. Cl. 244—3.16 **6 Claims**



1. A method of stopping out interfering radiators in a device for optically viewing the radiation of a missile through a lens aperture which includes an image field, and detector for viewing the radiation which is aligned with the lens axis and for steering the missile, comprising directing the radiation to a spot within the image field of the lens system and continuously directing the optical axis of the lens system to a target, disposing a modulator disc in association with the lens system and ahead of the radiation detector so that the radiation is viewed by the detector, determining the off position of the missile relative to the optical axis of the lens system, and after the missile is launched and after the off position is determined, setting an aperture stop reducing the image field of the lens system to an image area immediately surrounding the missile.

4,192,476

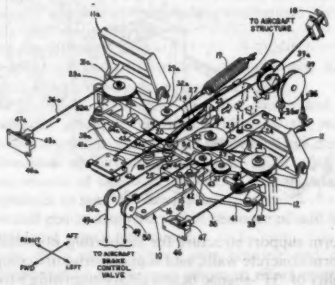
RUDDER PEDAL ADJUSTMENT SYSTEM

Leroy R. Byers, Redondo Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jul. 14, 1978, Ser. No. 919,469

Int. Cl.[2] B64C *13/04, 13/30*

U.S. Cl. 244—83 K **5 Claims**



1. In an aircraft having a cockpit, a rudder and brake control system, and pilot's manual rudder and brake control mechanism, comprising:

a. a track member rigidly attached to a floor portion of said aircraft,

b. a slide member slidably attached to said track member, said slide member including means for adjusting and locking said slide member along said track member,

c. a bar member pivotally attached to said slide member,

d. two rudder pedals pivotally attached to said bar member, and

e. rudder and brake control means to independently operate said aircraft rudder and brake systems through actuation of said rudder pedals, said brake control means includes two brake control cables, each of said cables having one end thereof attached to aircraft structure and rigged such that each of said cables extends around an inboard and an outboard brake pulley mounted on each side of said slide member with said cables extending from said inboard and outboard pulleys to said aircraft brake control system, wherein said brake control system is actuated by differential movement of said inboard and outboard brake pulleys operating on said brake control cables.

4,192,477

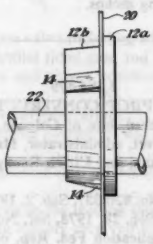
PIPE-WALL STUD CONNECTOR

John R. Decky, 1291 SE. 5th Ave., Pompano Beach, Fla. 33060, and Bruno P. Meyer, 560 NE. 44th St., Boca Raton, Fla. 33432

Filed Jul. 24, 1978, Ser. No. 927,486

Int. Cl.[2] F16L *5/00*

U.S. Cl. 248—56 **1 Claim**



1. An insulating device for securing and supporting a pipe, conduit or tube through an aperture in a metal wall stud or other thin planar surface comprising:

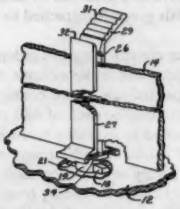
an annular flexible body having a radially circumferentially raised barrier wall (**12***a*) joined integrally with tapered body wall (**12***b*); said tapered wall (**12***b*) diameter being largest at the junction with said barrier wall and thereat sized to fit firmly in such stud aperture; said tapered wall (**12***b*) joining with ribs (**18**) an inner wall to form a circular pipe-engaging passage (**16**) and radial slot opening (**12***c*); said barrier wall (**12***a*) having an opening registering with said radial slot opening (**12***c*); the central axis of said passage (**16**) being offset from the central axis of said tapered body wall (**12***b*); said tapered body wall (**12***b*) having resilient locking means (**14**) spaced from and cooperable with said barrier wall (**12***a*) for engaging the thickness of a stud (**20**); said device being characterized in that it can be rotated to properly align the longitudinal axis of a pipe in a desired position relative to the stud aperture and can be mounted transversely by way of said slot and opening on a pipe which is already disposed through an aperture in the stud.

4,192,478

QUARTER TURN CIRCUIT BOARD GUIDE

Ronald A. Coules, Barrington, Ill., assignor to Richco Plastic Company, Chicago, Ill.

Filed Mar. 28, 1978, Ser. No. 891,021
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—222.3 11 Claims



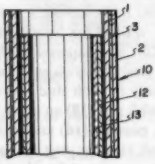
1. In a one piece plastic guide for supporting a circuit board upstanding on a panel, said guide comprising: a shaft, base means on one end of said shaft for resiliently securing said shaft upstanding on said panel, grooved retaining means parallel to the longitudinal axis of said shaft extending on one edge thereof for removably holding the edge of said circuit board therein, a gate on said shaft normally closing said retaining means to prevent unintended removal of said circuit board therefrom, and tab means connected to said gate for opening said retaining means to permit insertion and removal of said circuit board into and from said retaining means without disturbing the mounting of said base means on said panel, said retaining means having a bottom wall separated from said base means by slits permitting flexing of said base means independently of said retaining means.

4,192,479

MINE PROP CONSTRUCTION

Herbert Friebe, deceased, late of Cologne, Fed. Rep. of Germany; by Axel Rodert, administrator, Haydnstr. 3, Cologne, Fed. Rep. of Germany, and Ulrich Reininghaus, Alte Kölner Str. 24, 3

Continuation of Ser. No. 830,037, Sep. 2, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,584
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640104
Int. Cl.[2] E04G *25/04*
U.S. Cl. 248—354 H 11 Claims



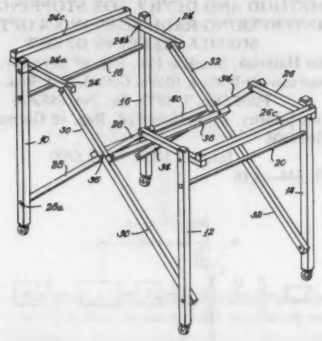
1. A hydraulic mine prop of aluminum for continuous operation in a mine without hot sparking, comprising an outer tubular prop portion and at least one inner tubular prop portion telescopically arranged in said outer prop portion, said prop portions both being provided with a protective jacket of hard metal on the outer surfaces of both the inner and outer props which is impact-resistant and prevents hot spark formation, said hard metal jacket having a thickness of from about 0.2 mm to 0.6 mm.

4,192,480

FOLDING STAND FOR BASSINET OR THE LIKE

Theodore F. Schmidt, 1223 N. Main St., Wheaton, Ill. 60187

Filed Aug. 28, 1978, Ser. No. 937,064
Int. Cl.[2] F16M *11/38*
U.S. Cl. 248—436 10 Claims



1. A folding framework, comprising in a single general plane:

a pair of spaced parallel legs;

a pair of bars articulated respectively from corresponding ends of the respective legs so as to be pivotable inwardly toward each other;

a pair of diagonal intersecting braces, each pivotally connected at opposite ends to the inner end of the respective bar and the opposite leg, said braces being pivotally interconnected where they intersect, said braces making approximately 45° angles with said legs and approximately 90° with each other when said framework is fully unfolded, and

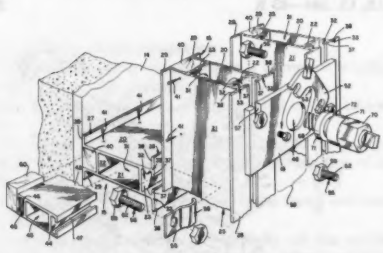
stop means for firmly stopping and holding the framework in its fully unfolded position in which said bars are approximately aligned at right angles to said legs, said stop means comprising a pair of stops square in cross section and affixed respectively upon respective braces to engage the other brace.

4,192,481

CONCRETE WALL FORMING SYSTEM

James Durbin, 2000 Old Lost Mountain Rd., Powder Springs, Ga. 30073

Filed May 26, 1978, Ser. No. 910,027
Int. Cl.[2] E04G *17/06*
U.S. Cl. 249—42 10 Claims



1. A form support structure for supporting plywood forms used to form concrete walls, said support structure comprising:

a plurality of "H"-shaped beams each comprising a front and back face and a central portion between said front and back faces, an elongated central cavity extending the

length of said beams through said central portion, a grooved channel formed in said central portion at said front face, extending the length of said beam adjacent said central cavity and including an opening in said front face extending the length of said beam, a bolt holding channel formed in said central portion at said back face of said beam, extending the length of said beam for slidably accepting the head of a bolt, and including a slot defined in said back face extending the length of said beam through which a bolt shaft can protrude from said bolt holding channel perpendicular to said beam face;

extension sliders for telescopic insertion into the elongated central cavity of said beams;

clip means for attaching any two said beams in perpendicular relation to one another;

a plurality of nailer means attachably inserted into said grooved channel,

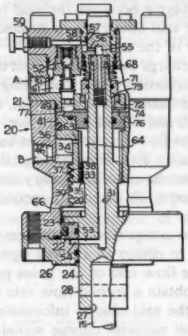
whereby said plurality of beams are arranged in a grid pattern having a first series of parallel beams backed by a second series of beams perpendicular to said first series and are held together by clipping said first and second series of beams together with said clip means, said nailer means are attached to said grooved channels of said first series of beams and said nailer means are fastened to said plywood form thus attaching said grid to said form.

4,192,482

HYDRAULIC ACTUATOR TO PROVIDE BOTH ROTARY AND LINEAR MOTIONS TO A MOVABLE VALVE

Holliday L. Goldman, Red Lion, Pa., and Svend E. Winther, Copenhagen, Denmark, assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 20, 1978, Ser. No. 952,996
Int. Cl.[2] F16K *39/06*; F01B *21/00*
U.S. Cl. 251—56 **3 Claims**



1. A totally enclosed actuator for effecting axial and rotary movement of a valve plug between a seated closed position and an unseated open position including mechanism operated by a pressure medium comprising:

a housing having a bore;

a first piston deposed within the bore of said housing for axial movement by the pressure medium;

coupling means connecting said first piston with the valve plug for effecting axial movement of the valve plug, wherein axial movement of said first piston in a first axial direction operates to unseat the valve plug and axial movement of said first piston in a second axial direction operates to seat the valve plug;

a second piston disposed within the bore of said housing for axial and rotary movement;

rotary drive means within said housing and operatively connected to said second piston to effect rotation of said second piston upon axial displacement thereof by the pressure medium, wherein the rotary movement of said second piston in a first direction operates to rotate the valve plug from a closed position to an open position and the rotary movement of said second piston in a second direction operates to rotate the valve plug from its open position to its closed position;

drive means operatively connected to transmit the rotary movement of said second piston to said coupling means to effect rotation of the valve plug upon axial displacement of said second piston by the pressure medium; and,

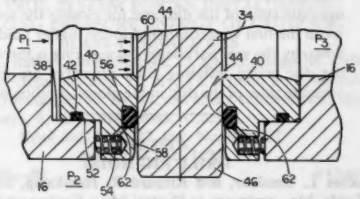
control means within said housing normally operable to prevent the movement of said first piston in its second direction of movement, said control means being constructed and arranged to be operated by said second piston upon said second piston completing its movement in its second direction wherein the valve plug is rotated from an open to a closed position.

4,192,483

ONE PIECE SEAT RING WITH O-RING SEAL

Marvin G. Combes, Castro Valley, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Dec. 20, 1978, Ser. No. 971,269
Int. Cl.[2] F16K *3/16*
U.S. Cl. 251—172 **5 Claims**



1. For use in a gate valve including a body with aligned flow passages, a first, parallel sided gate and means for moving said gate between open and closed positions relative to said flow passages;

a main seal assembly comprising:

a one-piece seat ring carried in said body upstream of said gate;

means biasing said seat ring against the upstream side of said gate;

an annular groove in the leading face of said seat ring; and

a resilient O-ring loosely received in said groove;

said leading face of the seat ring being relieved over the full area radially outward of said annular groove to provide a small clearance with the upstream side of the gate.

4,192,484

HIGH PRESSURE DISC VALVE

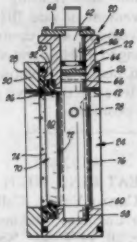
Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129

Filed Nov. 13, 1978, Ser. No. 959,718
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—173 **13 Claims**

1. In a valve including a valve body having a valve chamber therein containing a valve disc adapted to be turned between open and closed positions, and an annular groove in the valve body surrounding the valve chamber opposite the outer periphery of the disc when the disc is in the closed position, the improvement comprising:

a seat ring having a butt portion anchored to the valve body at one side wall of said groove and a seal portion extending generally axially from the butt portion to terminate in a free end near the opposite side wall of said groove, wherein the outer periphery of the seal portion is radially spaced from the outer periphery of said groove to form an annular cavity extending circumferentially about said seal portion, wherein the free end of said seal portion is spaced

from the valve body to form a first vent between the one end of the cavity and portions of the valve chamber on one side of the disc when the disc is in the closed position, and wherein a second vent is formed in the seat ring to provide fluid communication between the opposite end of said cavity generally adjacent said butt portion and portions of the valve chamber on the opposite side of the disc; and



elastomeric means in said annular cavity about the seal portion of seat ring for closing the first vent when the second vent is exposed to the higher of differing fluid pressures on opposite sides of the disc and for closing the second vent when the first vent is exposed to the higher fluid pressure, whereby the seal portion of the seat ring is forced against the disc when differing fluid pressures are exerted on opposite sides of the disc in the closed position of the disc.

4,192,485

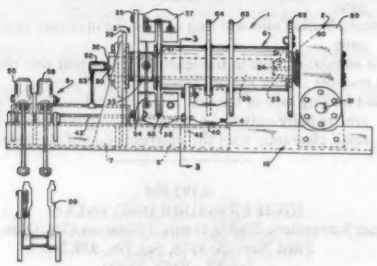
DRILL RIG HOIST

Charles L. Rassieur, and Richard R. Hesskamp, both of St. Louis, Mo., assignors to Central Mine Equipment Company, St. Louis, Mo.

Continuation of Ser. No. 749,158, Dec. 9, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,478

Int. Cl.² B66D 1/04

U.S. Cl. 254—187.5 **7 Claims**



1. In a drilling rig hoist connected to a power source, the improvement comprising a central shaft, bearing means for supporting said shaft at one end for rotation about a central axis and means for coupling its other end to a power source, a caliper mounting plate secured to said shaft for rotation with said shaft, a plurality of caliper means mounted on and symmetrically about said caliper mounting plate, each of said caliper means having spaced, oppositely disposed friction elements arranged for movement toward and away from one another, a drum, mounted for rotation on and with respect to said central shaft and a clutch rotor fixed to said drum for rotation with it, said clutch rotor being positioned to extend between said friction elements, and fluid pressure means for actuating said caliper means.

4,192,486

METHOD FOR CONTROLLING EXHAUST GASES IN OXYGEN BLOWN CONVERTER

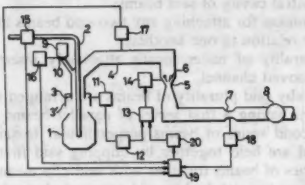
Yuziro Ueda; Toru Yoshida, both of Sakai, and Michiyasu Honda, Chihayaakasaku, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,288

Claims priority, application Japan, Dec. 20, 1975, 50/152281

Int. Cl.² C22B 5/40

U.S. Cl. 266—44 **1 Claim**



1. A method of controlling exhaust gases in an oxygen blown converter for recovering the exhaust gases in an unburnt state, comprising the steps of:

(a) providing means including a hood for recovering gases generated within the said converter in the unburnt state;

(b) providing a duct means communicating with the said hood for sucking the said gases;

(c) providing at least one damper means mounted in the said duct for adjusting the flow rate of the said gases;

(d) providing means for cleaning the said gases sucked through the said duct and for eliminating dust contained in the said gases;

(e) providing means for preventing air from penetrating into the said converter between the said hood and a furnace throat of the said converter to enhance the efficiency in the recovery of the said gases;

(f) providing a charge information input means for supplying a charge information signal consisting of the quantity of hot metal, the quantity of scrap metal, the temperarture of the hot metal, and the silicon content;

(g) detecting the flow rate of oxygen supplied to the converter to obtain a first flow rate signal;

(h) detecting the amount of secondary raw material charged to the converter to obtain a secondary raw material charge signal;

(i) analyzing the composition of the gases passing through the said duct to obtain an analysis signal;

(j) detecting the flow rate of the gases passing through the said duct to obtain a second flow rate signal;

(k) combining the said charge information signal, the said secondary raw material charge signal, the said analysis signal, the said first flow rate signal, and the said second flow rate signal and computing by calculation the amount of the generated gases after reaction, the amount of gases resulting from the decomposition reaction and the amount of combustion gases at the furnace throat:

(l) providing means for calculating a prediction control variable by using the output from step (k);

(m) detecting the pressure difference between the gas pressure within the said hood and atmospheric pressure to obtain a pressure differential signal;

(n) providing a pressure controlling adjusting means for receiving the said pressure differential signal and comparing it with a predetermined reference value to obtain an exhaust damper control signal for reducing the difference between the said pressure differential signal and the said reference value; and

(o) determining the optimum control signal to adjust the degree of opening of the said damper by combining said damper control signal from said pressure controlling adjusting means and the output signal from the said predic-

tion control variable calculating means in a signal processing circuit, wherein each of said output signals is multiplied by a respective coupling coefficient, said coefficient being responsive to equipment operational conditions, and transmitting the said optimum control signal from the said signal processing circuit to a servo mechanism for operating the said damper to minimize blow out and intake phenomena at the furnace throat of the said converter.

4,192,487

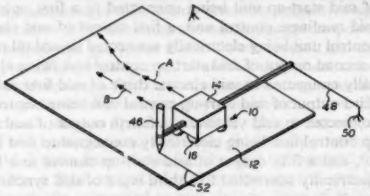
APPARATUS FOR CUTTING SHEET PLATE

Adrian H. Krieg, 2627 Dunning Dr., Yorktown, N.Y. 10598

Filed Jul. 18, 1978, Ser. No. 925,819

Int. Cl.[2] B23K *7/02, 7/10*

U.S. Cl. 266—58 **5 Claims**



1. Apparatus for cutting sheet plate comprising a trackless carriage, an elongated support rod journalled in said carriage for free linear movement relative to said carriage along a path parallel to the longitudinal axis of the rod, means for propelling said carriage in a direction substantially perpendicular to the longitudinal axis of the rod, an elongated extending guy mounted free of said carriage, means at one end of said rod for working said plate, and means on the other end of said rod cooperating with said guy whereby said rod is carried by said carriage in a direction perpendicular to the axis of the rod while said work means maintains a fixed position parallel to said guy irrespective of the direction of movement of the carriage.

4,192,488

MACHINE MOUNTED TORCH

Georg Roeder; Helmut Sachs, both of Frankfurt am Main, and Dieter Hajok, Hattersheim, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

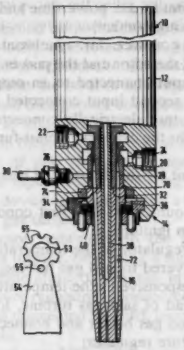
Filed Apr. 11, 1979, Ser. No. 29,359

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819073

Int. Cl.[2] B23K *7/00*

U.S. Cl. 266—77 **11 Claims**

1. In a machine mounted torch, such as machine mounted cutting torches, marking torches and the like, wherein a torch head has one end to which the torch is arranged in a machine mounting and on the other end to which a nozzle is exchangeably fastened by means of a holding device, the improvement being two support surfaces disposed opposite each other on said end of said torch body facing said nozzle, and said support



surfaces holding the counter surfaces of a spring loaded clamping bushing which holds said nozzle.

4,192,489

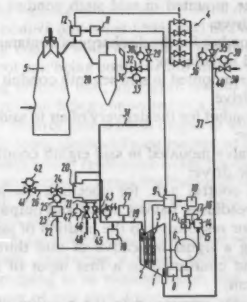
CONTROL SYSTEM FOR AN INSTALLATION UTILIZING PRESSURE ENERGY OF OUTGOING BLAST-FURNACE GAS

Vladimir A. Babich, Ulitsa Stachek 25, Kv. 33; Abram M. Vitlin, Prospekt Ordzhonikidze 11, Kv. 11; Arnold P. Kolchanov, Ulitsa 8 Marta 123/54, Kv. 17, and Elena I. Sheveleva, Ulitsa Taganskaya, 8, all of Sverdlovsk, U.S.S.R.

Filed Jul. 22, 1977, Ser. No. 818,167

Int. Cl.[2] C21B *7/00*

U.S. Cl. 266—88 **9 Claims**



1. A control system for an installation utilizing the energy of the pressure of outgoing blast-furnace gas, comprising:

an electric generator with a power-driven ventilator;

a gas turbine having a rotor to rotate said electric generator;

an air-cooling system for said electric generator;

an oiling system for said gas turbine and said electric generator having an oil pump;

a control diaphragm gate mounted on said gas turbine;

a closing diaphragm gate mounted on said gas turbine;

a throttle unit placed in parallel with said gas turbine;

a regulating system for regulating the rotational speed of said rotor of said gas turbine connected to said control and closing diaphragm gates;

a selector of the rotational speed for said rotor being part of said regulating system;

a pressure regulator of the pressure of the blast-furnace under the top of the blast furnace;

a converting device for converting input signals received

from said pressure regulator connected to said throttle unit and to said regulating system;

a switch connecting and disconnecting said electric generator to and from an a.c. power line and having a signalling and interlocking contact;

a synchronizing device for synchronizing the rotational frequency of the rotor and the power line frequency having a first input connected to an output of said electric generator, a second input connected to said power line, and a first output electrically connected to said switch;

a first conduit for the delivery of blast-furnace gas to said gas turbine;

a second conduit for the delivery of blast-furnace gas to the installation;

a gas heater mounted on said first conduit and being provided with an ignitor;

a temperature regulator of the temperature of the blast-furnace gas delivered to said gas turbine;

a first sensor responsive to the temperature of the blast-furnace gas ahead of said gas turbine, located on said first conduit of said gas heater and connected to the input of said temperature regulator;

a second sensor responsive to the temperature of the blast-furnace gas ahead of said gas turbine;

a first valve mounted in said second conduit and having an electric drive;

a third conduit for the discharge of blast-furnace gas from said installation;

a second valve mounted on said third conduit and having an electric drive;

a fourth conduit for the delivery of gas to said gas heater;

a third valve mounted in said fourth conduit and having an electric drive;

a fifth conduit for the delivery of gaseous fuel to the ignitor of said gas heater;

a fourth valve mounted in said fifth conduit and having an electric drive;

a sixth conduit for the delivery of inert gas to said installation;

a fifth value mounted in said sixth conduit and having an electric drive;

a seventh conduit for the discharge of contaminated inert gas from said installation;

a sixth valve mounted in said seventh conduit and having an electric drive;

an eighth conduit for the delivery of air to said ignitor of said gas heater;

a seventh valve mounted in said eighth conduit and having an electric drive;

a readiness control unit, for checking the installation for start-up readiness, having inputs and outputs;

a third sensor responsive to the position of said third valve, producing a signal indicative of said third valve being closed and connected to a first input of said readiness control unit;

a fourth sensor responsive to the position of said seventh valve, producing a signal indicative of said seventh valve being closed, and connected to a second inut of said readiness control unit;

a fifth sensor responsive to the position of said fourth valve, producing a signal indicative of said fourth valve being closed, and connected to a third input of said readiness control unit;

a sixth sensor responsive to the air pressure in said fourth conduit ahead of said third valve, producing a signal indicative of said air pressure being within operative limits, and connected to a fourth input of said readiness control unit;

a seventh sensor responsive to the air pressure in said eighth conduit ahead of said seventh valve, producing a signal indicative of said air pressure being within operative limits, and connected to a fifth input of said readiness control unit;

an eighth sensor responsive to the gaseous-fuel pressure in said fifth conduit ahead of said fourth valve, producing a signal indicative of the gaseous-fuel pressure being within operative limits, and connected to a sixth input of said readiness control unit;

a ninth sensor responsive to the oil level in the oiling system of said gas turbine, producing a signal indicative of the oil level being within operative limits, and connected to a seventh input of said readiness control unit;

a tenth sensor responsive to the position of said closing diaphragm gate, producing a signal indicative of said closing diaphragm gate being closed, and connected to an eighth input of said readiness control unit;

an eleventh sensor responsive to the position of said control diaphragm gate, producing a signal indicative of said control diaphragm gate being closed, and connected to a ninth input of said readiness control unit;

a twelfth sensor responsive to the position of said selector, producing a signal indicative of said selector being in an initial position, and connected to a tenth input of said readiness control unit;

a thirteenth sensor responsive to the position of said converting device, producing a signal indicative of said converting device being in an initial position, and connected to an eleventh input of said readiness control unit;

a start-up control unit having inputs and outputs, a first input of said start-up unit being connected to a first output of said readiness control unit, a first output of said start-up control unit being electrically connected to said oil pump, a second output of said start-up control unit being electrically connected to said electric drive of said first valve, a third output of said start-up control unit being electrically connected to said ventilator, a fourth output of said start-up control unit being electrically connected to said selector, and a fifth output of said start-up control unit being electrically connected to a third input of said synchronizing device;

a fourteenth sensor responsive to the oil pressure in said oiling system of said gas turbine, producing a signal indicative of said oil pressure being within operative limits, and connected to a second input of said start-up control unit;

a fifteenth sensor responsive to the position of said first valve, producing a signal indicative of said first valve being in an open position, and connected to a third input of said start-up control unit;

a sixteenth sensor responsive to the position of said first valve, producing a signal indicative of said fourteenth valve being in a closed position, and connected to a fourth input of said start-up control unit;

a seventeenth sensor responsive to the air pressure in said cooling system of the electric generator, producing a signal indicative of said air pressure being of a specified value, and connected to a fifth input of said start-up control unit;

an eighteenth sensor responsive to the rotational speed of the rotor, producing a signal indicative of the rotational frequency of said rotor reaching a value about equal to the electric-generator synchronizing frequency, and connected to a sixth input of said start-up control unit;

a synchronizing control unit, for synchronizing the electric-generator frequency and the power-line frequency, having inputs and outputs, a first input of said synchronizing control unit being connected with a sixth output of said startup control unit, a second input of said synchronizing control unit being connected with said signalling and interlocking contact of said switch, said contact of said switch emitting a signal indicative of the electric generator being connected to the power line, a first output of said synchronizing control unit being connected to said selector to increase the rotational speed of the rotor of said gas turbine, a second output of said synchronizing control unit being connected to said selector to reduce the rotational speed of the rotor of said gas turbine;

a nineteenth sensor responsive to the position of said selector, producing a signal indicative of the selector being

shifted to its extreme position for an increase in rotor speed, and connected to a third input of said synchronizing control unit;

a twentieth sensor responsive to the rotational speed of the rotor, producing a signal indicative of the minimum rotor speed at which the electric-generator frequency can be synchronized with the power line frequency, and connected to a fourth input of said synchronizing control unit;

a load control unit for increasing the load of the gas turbine having inputs and outputs, a first input of said load control unit being connected with a third output of said synchronizing control unit, a third input of said load control unit being connected to said nineteenth sensor, a first output of said load control unit being connected to said selector;

a twenty-first sensor responsive to the flow rate of the furnace gas, producing a signal indicative of the maximum rate of gas flow through said gas turbine without operating the gas heater, and connected to a second input of said load control unit;

a heating control unit for controlling the heating of blast-furnace gas having inputs and outputs, a first input of said heating control unit being connected to a second output of said load control unit, a second input of said heating control unit being connected with a second output of said readiness control unit, which produces respective signals indicative of the minimum and maximum gas temperatures at which said gas heater is shut down, seventh and eighth inputs of said heating control unit being connected to said second sensor, a first output of said heating control unit being electrically connected to said electric drive of said seventh valve to open said seventh valve, a second output of said heating control unit being electrically connected to said electric drive of said fourth valve to open said fourth valve, a third output of said heating control unit being electrically connected to said electric drive of said third valve to open said third valve, a fourth output of said heating control unit being electrically connected to said ignitor, a fifth output of said heating control unit being electrically connected to said temperature regulator for switching it "on" and "off", a sixth output of said heating control unit being electrically connected to said electric drive of said seventh valve to close said seventh valve, a seventh output of said heating control unit being electrically connected to said electric drive of said fourth valve to close said fourth valve, an eighth output of said heating control unit being electrically connected to said electric drive of said third valve to close said third valve;

a twenty-second sensor responsive to the flow rate of furnace gas, producing a signal indicative of the rate of gas flow through said gas turbine reaching a value at which the gas heater is actuated and connected to a third input of said heating control unit;

a twenty-third sensor responsive to the temperature of gas at the outlet of said ignitor, producing a signal indicative of said gas temperature exceeding its ignition point and connected to a fourth input of said heating control unit;

a twenty-fourth sensor responsive to the position of said third valve, producing a signal indicative of said third valve being in an open position, and connected to a fifth input of said heating control unit;

a twenty-fifth sensor responsive to the flow rate of furnace gas, producing a signal indicative of the minimum rate of gas flow through the gas turbine at which the delivery of air to the gas heater is stopped, and connected to a sixth input of said heating control unit;

a changeover control unit, which is used to connect and disconnect an output of said pressure regulator through said converting device to an input of said regulating system or to an input of said throttle unit, having inputs and outputs, a first input of said changeover control unit being connected with a ninth output of said heating control unit, a second input of said changeover control unit being connected to a tenth output of said heating control unit, a third input of said changeover control unit being connected with an eleventh output of said heating control unit, a fourth input of said changeover control unit being connected to said twenty-first sensor, a first output of said changeover control unit being electrically connected to said selector, a second output of said changeover control unit being electrically connected to said pressure regulator for connection and disconnection thereof through said converting device to the input of said regulating system, a third output of said changeover control unit being electrically connected to said pressure regulator for connection and disconnection thereof to the input of said throttle unit, a fourth output of said changeover control unit being connected to the input of said regulating system through said converting device for transmitting a signal to reduce the load of said gas turbine;

a twenty-sixth sensor responsive to the gas temperature ahead of said gas turbine, producing a signal indicative of the minimal temperature of the gas in said turbine at which said pressure regulator is connected to said input of said selector, and connected to a fifth input of said changeover control unit;

a shut-down control unit having inputs and outputs, a first input of said shut-down control unit being connected with a seventh output of said start-up control unit, a second input of said shut-down control unit being connected to said tenth sensor, a sixth of said inputs of said shut-down control unit being connected to said second sensor, a first output of said shut-down control unit being connected to a seventh input of said start-up control unit, a second output of said shut-down control unit being connected to an eighth input of said start-up control unit, a third output of said shut-down control unit being electrically connected to an input of said regulating system for rapid opening and closing of said control and closing diaphragm gates, a fourth output of said shut-down control unit being electrically connected to said selector to transmit a signal thereto for its return to the initial position, a fifth output of said shut-down control unit being connected to a ninth input of said heating control unit, a sixth output of said shut-down control unit being connected to a tenth input of said heating control unit, a seventh output of said shut-down control unit being connected to an eleventh input of said heating control unit, an eighth output of said shut-down control unit being connected to a sixth input of said changeover control unit, a ninth output of said shut-down control unit being electrically connected to said switch;

a twenty-seventh sensor responsive to the rotational speed of the rotor, producing a signal indicative of the maximum rotor speed, and connected to a third input of said shut-down control unit;

a twenty-eighth sensor responsive to the oil pressure in the oiling system, producing a signal indicative of the oil pressure dropping to its minimal value, and connected to a fourth input of said shut-down control unit;

a twenty-ninth sensor responsive to the position of said first valve, producing a signal indicative of said first valve being in an open position, and connected to a fifth input of said shut-down control unit;

a thirtieth sensor responsive to the maximum temperature of bearings of said gas turbine and said electric generator and connected to a seventh input of said shut-down control unit;

a thirty-first sensor responsive to vibration of bearings of said gas turbine and said electric generator and connected to an eighth input of said shut-down control unit;

a supply control unit for controlling the filling and emptying of the installation having inputs and outputs, a first input of said supply control unit being connected with a tenth output of said shut-down control unit, a second input of said supply control unit being connected to said sixteenth sensor, a first output of said supply control unit being connected to a twelfth input of said readiness control unit, a second output of said supply control unit being electrically connected to said electric drive of said first valve to

close said first valve, a third output of said supply control unit being electrically connected to said electric drive of said second valve to close said second valve, a fourth output of said supply control unit being electrically connected to said electric drive of said fifth valve to close said fifth valve, a fifth output of said supply control unit being electrically connected to said electric drive of said sixth valve to close said sixth valve, a sixth output of said supply control unit being electrically connected to said electric drive of said second valve to open said second valve, a seventh output of said supply control unit being electrically connected to said electric drive of said fifth valve to open said fifth valve, an eighth output of said supply control unit being electrically connected to said electric drive of said sixth valve to open said sixth valve;

a thirty-second sensor responsive to the position of said second valve, producing a signal indicative of said second valve being in a closed position, and connected to a third input of said supply control unit;

a thirty-third sensor responsive to the position of said second valve, producing a signal indicative of said second valve being in an open position, and connected to a fourth input of said supply control unit;

a thirty-fourth sensor responsive to the position of said fifth valve, producing a signal indicative of said fifth valve being closed, and connected to a fifth input of said supply control unit;

a thirty-fifth sensor responsive to the position of said fifth valve, producing a signal indicative of said fifth valve being in an open position, and connected to a sixth input of said supply control unit;

a thirty-sixth sensor responsive to the position of said sixth valve, producing a signal indicative of said sixth valve being in a closed position, and connected to a seventh input of said supply control unit;

a thirty-seventh sensor responsive to the position of said sixth valve, producing a signal indicative of said sixth valve being in an open position, and connected to an eighth input of said supply control unit.

4,192,490

LANCE FOR INJECTING POWDERY MATERIAL INTO MOLTEN METAL

Per A. Nilsson; Gunnar B. Harryson; Leif T. Larsson; Karl J. Poderschan, all of Fagersta; Pekka Ritakallio, and Theo Lehner, both of Lulea, all of Sweden, assignors to Stiftelsen for Metallurgisk Forskning, Lulea, Sweden

Filed Sep. 26, 1978, Ser. No. 945,821

Claims priority, application Sweden, Oct. 4, 1977, 7711065

Int. Cl.[2] C21C *5/48*

U.S. Cl. 266—225 **7 Claims**

1. An elongate lance for injecting a powdery material carried by a carrier gas into metal melts in a ladle, comprising:

a tubular body with an inner pipe bore having an inlet and an outlet end;

a rounded tip formed of ceramic material located at the outlet end of said tubular body; and

at least one outlet duct having an inlet opening adjacent the outlet end of the pipe bore and an outlet opening located above said tip, said duct forming an angle of less than 90° with the longitudinal axis of the lance and being directed slopingly outwards and downwards from the pipe bore towards said tip;

such that the lance is lowered into the ladle until said tip abuts against the bottom of the ladle and the powdery material is carried by the carrier gas through the pipe bore and said duct, exiting into the metal melt above said tip.

4,192,491

ROTATABLE OR TILTABLE METALLURGICAL VESSEL

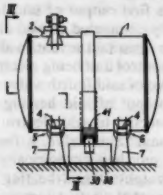
Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 3, 1978, Ser. No. 893,051

Claims priority, application Austria, Apr. 14, 1977, 2590/77; Aug. 3, 1977, 5709/77

Int. Cl.[2] C21C *1/06*; F16C *11/02*

U.S. Cl. 266—245 **19 Claims**



1. In a rotatable or tiltable metallurgical vessel, e.g. a pig iron mixer, of the type including a jacket, a fixed bearing and an expansion bearing for mounting said metallurgical vessel, two raceways fastened to said jacket of said metallurgical vessel at a distance from each other, one of said two raceways being mounted in said fixed bearing and the other of said two raceways being mounted in said expansion bearing, a toothed element arranged on said jacket of said metallurgical vessel between said two raceways, a driven counter-element engaging with said toothed element, and drive means for driving said driven counter-element, the improvement characterized in that said expansion bearing and said fixed bearing are designed as slide bearings, each slide bearing including one of said two raceways and an arcuate slideway formed by a plurality of slide plates, each one of said two raceways resting on its pertaining arcuate slideway.

4,192,492

DEVICE FOR FABRICATION OF TAPHOLES IN METALLURGICAL VESSELS

Harry A. Marsh, Jr., Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

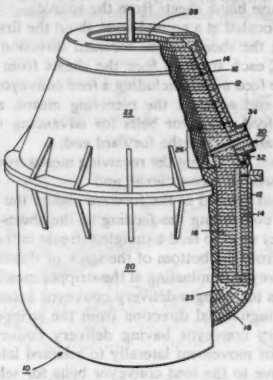
Filed Mar. 23, 1979, Ser. No. 23,417

Int. Cl.[2] F27D *1/16*

U.S. Cl. 266—281 **6 Claims**

1. A device for installing a taphole, composed of refractory blocks and sleeves, in a metallurgical vessel having an outer metal shell, a refractory lining in contact with the interior of the shell and a taphole opening passing through the metal shell comprising a vertical wall conforming to the silhouette of the taphole blocks, a pair of lower wing members extending laterally from each side of the wall to the extent of the width of the

taphole blocks, and a vertical neck member extending forwardly of the vertical wall, said neck member terminating in a



laterally extending wing conforming substantially to the internal and external dimensions of the taphole sleeves.

4,192,493

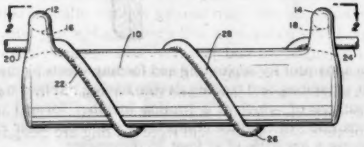
SHOCK-ABSORBING LINE DEVICE

Walter L. Koughan, 18011 NE. 196th St., Woodinville, Wash. 98072

Continuation of Ser. No. 812,083, Jul. 1, 1977. This application Sep. 14, 1978, Ser. No. 942,203

Int. Cl.[2] F16F *1/46*

U.S. Cl. 267—74 **2 Claims**



1. Shock-absorbing line device comprising:

a resilient cylindrical member having an axis;

a first line engaging said member at one end and effective when tensioned to apply a torque to said member about said axis;

a second line engaging said member at the opposite end and effective when tensioned to apply a counter-torque to said member about said axis;

a flange aligned on the same side and substantially normal to said axis at each end of said member, each said flanges having an eyelet passing through it;

each of said lines being passed through the respective eyelet and wound around said member;

said eyelet being substantially larger than the cross-section of said lines, whereby said lines will slide freely in said eyelets;

whereby upon tensioning of said lines, said resilient member is torsionally strained about said axis to absorb shock in said lines.

4,192,494

CUTTER MAT AND METHOD OF MAKING SAME

Rikichi Mima, Ikoma, Japan, assignor to Miwa Gomu Kogyo Kabushiki Kaisha, Japan

Filed Jan. 9, 1978, Ser. No. 867,870

Claims priority, application Japan, Feb. 9, 1977, 52-15410[U]

Int. Cl.[2] B32B *7/02, 27/00;* B23Q *3/00*

U.S. Cl. 269—289 R **4 Claims**

1. A cutter mat for use as a support upon which sheet material such as a sheet of paper or plastic to be cut is placed on either side, comprising a base plate of synthetic resin, two intermediate layers of synthetic resin each laminated to one side of said base plate, and two surface layers of synthetic resin each laminated to one of said intermediate layers to thereby provide a five-ply laminated mat, each of said intermediate layers being of the same thickness and having the same coefficient of expansion and contraction, each of said surface layers being of the same thickness and having the same coefficient expansion and contraction, such that both sides of the mat on opposite sides of the base plate are symmetrical with respect to the base plate and have the same coefficients of expansion and contraction to thereby preclude warping of the mat due to temperature variations, said surface layers having a softness and restoring property such that a cutting knife will penetrate into said surface layer along a cut line which closes and restores itself upon withdrawal of the knife, said intermediate layers being harder than said surface layers to provide increased resistance to further penetration of the knife into the mat without impairing the cutting operation and at the same time protecting the base plate from penetration by said knife, said base plate being harder than said intermediate layers to thereby provide rigidity to the cutting mat while the softer surface and intermediate layers provide flexibility to the mat, said surface layers each having on their outer surface a woven patten of projections and indentations corresponding to that of a woven fabric and obtained by peeling a woven fabric from said outer surfaces subsequent to heating and pressing thereof, whereby the woven pattern of projections and indentations provides a fine roughened surface to prevent slipping of the mat and without impairing the functioning of the surface layers to stably support the sheet material during the cutting operation.

4,192,495

FILM FEEDER

Karl-Georg Heinzelmann, Neunkirchen, and Sigismund Klein, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,515

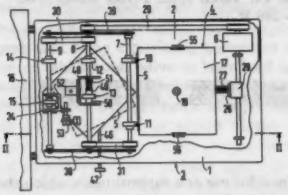
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707777

Int. Cl.[2] B65H *5/00*

U.S. Cl. 271—10 **8 Claims**

1. A film feeder for feeding automatic developers with individual film sheets, including a receiver magazine for the film sheets, an extraction device and a transport device for the transferral of the individual film sheets extracted from the receiver magazine in a sheet transport direction for supply to an automatic developer, the transport device having sheet rotation apparatus (7 to 15, 48 to 51) for the rotation of the film sheets (5) by approximately 45° about their surface normal, characterized in that the sheet rotation apparatus for rotating the film sheets (5) comprises three shafts (7, 8, 9) arranged successively in the sheet transport direction, each disposed

generally perpendicularly to the sheet transport direction and parallel to the transport plane, the first shaft (7) in the sheet transport direction carrying driven transport rollers (10, 11) each associated with one of two edge regions of the transport path, the second and third shafts (8, 9) in the sheet transport direction each carrying a driven transport roller (12, 14) associated respectively with one edge region, the third shaft carrying a driven transport roller (15) associated with the middle of a transport path, and a controlled transport roller (13) arranged on the second shaft (8) and associated with the middle of the transport path, said controlled transport roller being slightly braked but mounted in a free-wheeling manner on the second shaft.

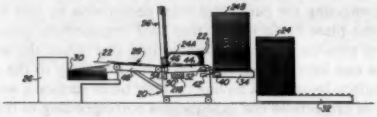


4,192,496

APPARATUS FOR FEEDING CASE BLANK SHEETS

Louis R. Baselice, Cliffside Park; Anthony Freakes, Leonia; Joseph A. Miller, Englewood, and George A. Ventz, Clifton, all of N.J., assignors to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Mar. 9, 1978, Ser. No. 885,040
Int. Cl.[2] B65H *3/04, 1/26, 3/54*
U.S. Cl. 271—10 **14 Claims**



1. A case blank sheet feeder for receiving a stack of case blank sheets from a source of supply and delivering the sheets in a forward direction from the bottom of the stack in shingled arrangement for further processing, said case blank sheet feeder comprising:

receiving means located at a first level for receiving the stack of case blank sheets from the source;

feed means located at a second level above the first level for advancing the sheets in the forward direction from the bottom of each stack to feed the sheets from the sheet feeder:

elevator means for raising the receiving means from the first level toward the second level, the elevator means including an elevator for moving the receiving means in a vertical direction generally perpendicular to the forward direction, dwell means for stopping the receiving means at a further level intermediate the first level and the second level, and override means for deactivating the dwell means to enable the elevator means to raise the receiving means to the second level;

stripper means associated with the feed means for controlling the feeding of the sheets from the sheet feeder so as to feed a shingled stream in the forward direction from the bottom of the stack of sheets; and

stabilizing means for precluding toppling of the stack in a backward direction during feeding of the sheets from the bottom of the stack.

7. A case blank sheet feeder for receiving a stack of case blank sheets from a source of supply and delivering the sheets in a forward direction from the bottom of the stack, one sheet at a time in shingled arrangement, for further processing, said case blank sheet feeder comprising:

receiving means located at a first level for receiving the stack of case blank sheets from the source;

feed means located at a second level about the first level for delivering the sheets in the forward direction from the bottom of each stack to feed the sheets from the sheet feeder, the feed means including a feed conveyor having a rearward end adjacent the receiving means, a forward end, and feed conveyor belts for advancing the sheets longitudinally toward the forward end;

elevator means for raising the receiving means from the first level toward the second level; and

stripper means located at the forward end of the feed conveyor for controlling the feeding of the sheets from the sheet feeder so as to feed a shingled stream in the forward direction from the bottom of the stack of sheets;

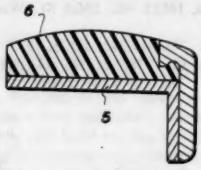
the feed conveyor terminating at the stripper means, and the feed means including a delivery conveyor extending in a forward longitudinal direction from the stripper means, the delivery conveyor having delivery conveyor belts mounted for movement laterally to selected lateral locations relative to the feed conveyor belts for selected adjustment to different lateral widths so as to accommodate sheets of different lateral widths while enabling ease of access to the sheets on the delivery conveyor.

4,192,497

COMPOSITION FOR THE SURFACE OF SHEET SEPARATING DEVICES

William D. Perun, and Paul C. Amatangelo, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 464,393, Apr. 26, 1974, abandoned.
This application Feb. 28, 1977, Ser. No. 772,388
Int. Cl.[2] B65H *3/52*
U.S. Cl. 271—18 **20 Claims**



1. In an apparatus for separating and feeding sheets by means of a sheet separating and feeding device having a retard member the surface of which is a friction member formed of a resilient material, the surface comprising a microcellular elastomer having a hardness of at least 25 durometer.

4,192,498

SHEET SEPARATING AND FEEDING APPARATUS

John A. Toto, Milford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 947,532
Int. Cl.[2] B65H *3/30*
U.S. Cl. 271—21 **8 Claims**

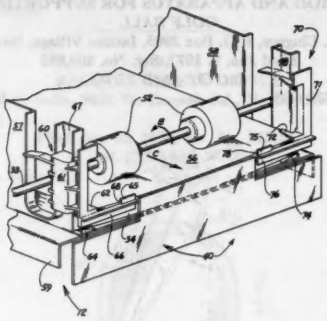
1. A two-stage sheet separating and feeding apparatus for separating and feeding the top sheet from a stack of sheets, comprising:

means for frictionally feeding the top sheet of a stack of sheets along a predetermined path;

a first separator stage including a pair of corner separators, each of said corner separators being operatively associated with one of the two corners of the leading edge of said stack of sheets for separating the top sheet from the stack of sheets; and

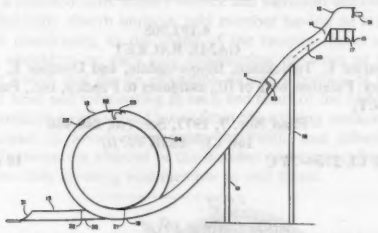
a second separator stage downstream of said first separator stage for separating the top sheet from any lower sheets

which may have been carried along with the top sheet past the first separator stage, said second separator stage including a pair of retarding blades, each of said retarding blades being operatively associated with one of the corner



separators and having a transverse groove for receiving the leading edge of a plurality of sheets wherein all but the top sheet is retarded in its forward movement along the predetermined path.

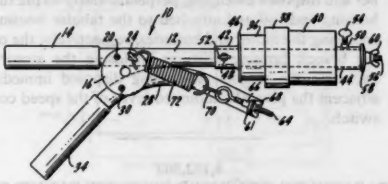
4,192,499
LOOPED SLIDE
Kenneth L. Groves, Jr., 1909 Fifth St., Ceres, Calif. 95307
Filed Jan. 17, 1978, Ser. No. 870,199
Int. Cl.[2] A63G *21/02*
U.S. Cl. 272—56.5 R **8 Claims**



1. A slideway amusement device for conveying a person in a sitting posture from a first position to a second position by low-friction, sliding contact with said device comprising an acceleration element having a smooth sliding-contact surface, at least one tubular, vertical looping element substantially circular in cross-section and having a smooth sliding-contact surface, and a deceleration element having a smooth sliding-contact surface.

4,192,500
RACQUET GAME EXERCISER
Dennis W. Crow, and William E. Kreger, both of 3019 Mac Heath Crescent, Flossmoor, Ill. 60422
Filed Apr. 10, 1978, Ser. No. 895,152
Int. Cl.[2] A63B *11/08*
U.S. Cl. 272—68 **9 Claims**

1. An apparatus capable of being employed by a single human user comprising an elongated member having a weight and a substantially straight longitudinal axis; weight means locatable toward one end of said elongated member to provide additional weight to said apparatus; and grip means positioned in association with said elongated member, said grip means including two elements capable of being grasped in one hand by said human user to hand hold said apparatus, one of said elements being located at or near the end of said elongated member away from said weight means and having substantially the same longitudinal axis as said elongated member, said elements being movable toward each other by said human user,



said grip means further including bias means acting to provide force to urge said elements apart, said bias means being structured to allow said force to be adjustable over a substantially continuous range.

4,192,501
ELECTRIC JUMP ROPE
John R. Peoples, Rte. 9, Box 457, Johnson City, Tenn. 37601
Filed Nov. 16, 1977, Ser. No. 852,158
Int. Cl.[2] A63B *5/20*
U.S. Cl. 272—75 **2 Claims**

1. A jump rope comprising, in combination:

(a) a longitudinally extending member having longitudinally spaced ends, and comprising: a tubular housing; an elongated rod journalled within the housing and extending therefrom at the longitudinally spaced ends of the member, the tubular housing and rod extending longitudinally of the extent of the member;

(b) a flexible element having end portions attached directly to the rod at points thereon outside of the tubular housing;

(c) motor means including a variable speed electric motor mounted at one of the ends of the elongated member, batteries for energizing the motor being mountable at the other of the ends of the member, and a cable electrically connecting the motor to the batteries, the cable extending along the longitudinal extent of the member;

(d) a variable speed switch inserted in the cable for controlling the speed of the motor, said switch including: rheostat provided with a plurality of contacts; and a lever pivotally mounted on the member and having a pair of diverging arms, one of the arms engaging the rheostat for varying the resistance of the rheostat, and the other of the arms being engageable by a hand of a person grasping the member for pivoting the member and moving the other of the arms toward the member and decreasing the resistance of the rheostat;

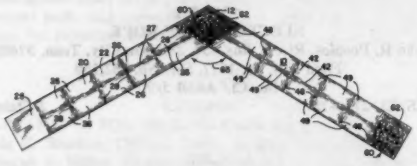
(e) a spring mounted on the member and engaging the other of the arms of the lever for biasing the other of the arms away from the member;

(f) a ratchet mounted on the member and arranged engaging the other of the arms of the lever for holding in any one of a plurality of positions against the bias of the spring and

varying the speed of the motor in predetermined increments; and

(g) wherein the member further includes branch housing portions provided at either longitudinal end of the member and disposed extending perpendicularly to the tubular housing and rod and attached to the tubular housing for enclosing the motor and batteries, respectively, the one of the branch housing portions enclosing the motor also enclosing the rheostat and being disposed immediately adjacent the pivotally mounted lever of the speed control switch.

4,192,502
WRAPAROUND WEIGHTED EXERCISE DEVICE FOR THE FOOT AND ANKLE
Robert Owen, 49 Concord Ave., North Kingston, R.I. 02852
Filed Aug. 11, 1978, Ser. No. 932,775
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—119 **12 Claims**



6. A V-shaped exercising device for wearing about the foot and ankle of a wearer comprising:

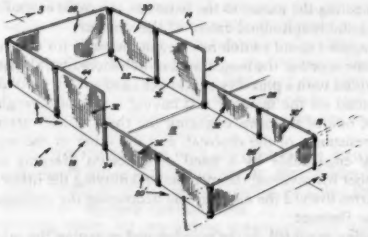
first and second elongate and flexible legs each having a longitudinal length greater than its width;

said legs meeting at a common apex section in an angular relation to define an included angle therebetween having a quantity less than 180 degrees, and each of said legs having a free end portion disposed in spaced relation to said common apex section;

weight means disposed along the length of each said leg; and

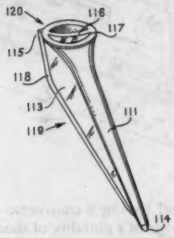
fastening means disposed on said apex section and on said free end portions of each said leg for releasably affixing one said leg about the ankle and said other leg about the foot of the wearer and securing each of said free end portions to said apex section.

4,192,503
TENNIS SERVING CAGE
Anthony J. Karas, 634 Beverly Dr., Macomb, Ill. 61455
Filed Aug. 22, 1978, Ser. No. 938,301
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—29 A **10 Claims**



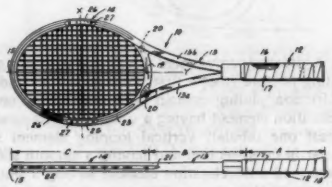
8. In combination with a standard U.S. Lawn Tennis Association tennis court having a designated service court area, a serving cage for capturing tennis balls served into the service court area, the serving cage comprising a continuous barrier having a rectangular configuration in plan and conforming dimensionally to the periphery of said service court area .

4,192,504
METHOD AND APPARATUS FOR SUPPORTING A GOLF BALL
Robert G. Clugage, P.O. Box 5905, Incline Village, Nev. 89450
Filed Jun. 9, 1977, Ser. No. 804,992
Int. Cl.[2] A63B *57/00*
U.S. Cl. 273—33 **8 Claims**



3. A golf tee comprising: (1) An elongated stem tapering to a point at one end and to an enlarged golf ball supporting area at the other end, said enlarged end having a suitable configuration to support a golf ball; (2) A rib formed within the configuration suitable to support a golf ball; (3) A pointer depending outward from the golf ball supporting surface and in alignment with said rib; and (4) a fin directionally aligned with said rib and pointer and extending from the said enlarged golf ball supporting portion along the stem.

4,192,505
GAME RACKET
Maurice L. Tabickman, Bloomingdale, and Douglas E. Dempsey, Palatine, both of Ill., assignors to Pepsico, Inc., Purchase, N.Y.
Filed Nov. 7, 1977, Ser. No. 848,940
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 C **18 Claims**



1. A game racket frame of controlled stiffness properties composed of an integral structure of high modulus fibers in a matrix of a synthetic resin, said fibers having a specific modulus of elasticity of at least 6×10^7 inches, said integral structure being of substantially uniform wall thickness throughout, and including a rounded open head portion, an open throat portion forming a continuation of said head portion and a handle portion terminating said throat portion, said handle portion having a generally uniform height greater than the height of the remainder of said frame and having the greatest moment of inertia of any portion of said frame, said handle being composed of two mating portions each of which is non-symmetrical with respect to a vertical plane passing through its center, said frame having a substantially uniform taper extending from the inward end of said handle portion into and through said throat portion, thereby providing a smooth decrease in stiffness in said throat portion from said handle portion to said head

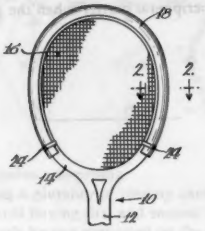
portion, said smooth taper extending into said head portion to an extent of at least 15% of the long axis of the open head portion, said throat also having a non-symmetrical cross section with respect to a vertical plane passing through its center, said frame providing the characteristics of a variable cross section beam.

4,192,506

RACQUET SAFETY DEVICE

Anthony A. Sofia, 9035 W. Cermak Rd., North Riverside, Ill. 61466

Filed Jun. 13, 1978, Ser. No. 915,147
Int. Cl.[2] A63B 59/00
U.S. Cl. 273—73 R **1 Claim**



1. In combination, a racquet and a safet device mounted thereon, said racquet comprising a head comprising a frame surrounding a striking surface, and a handle extending away from the head, said safety device comprising an elongate member of compressible foam material of constant cross section having a rounded outer impact surface and sufficient thickness to substantially absorb impacts, said member having an inner channel conforming to the shape of the racquet frame and having shoulders on each side overlapping the sides of the racquet frame, said device extending around a portion of the racquet head and terminating at each end short of the handle, said shoulders being spaced away from the striking surface of the racquet to avoid interference therewith, and adhesive means between the channel of the member and racquet frame for removably securing said member to said frame.

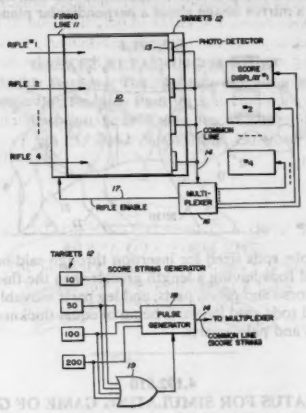
4,192,507

LIGHT ACTUATED SHOOTING ARCADE GAME

Lyle V. Rains, San Jose; Stephen D. Bristow, Los Altos Hills, and Richard J. Patak, Cupertino, all of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 813,807, Jul. 8, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,429
Int. Cl.[2] F41J 5/02; A63F 9/02
U.S. Cl. 273—311 **1 Claim**

1. A shooting arcade game having a plurality of rifles with triggers actuated by game players shooting at a common plurality of targets comprising: a light source adapted to be affixed to each of said rifles and to be actuated by said trigger to produce a light flash; a photo-detector for each of said targets, respectively, for sensing a light flash striking a target, each of the photo-detectors and thereby its respective target being assigned a weighted scoring value at least one value being different from the other values; a score display for each of said rifles, respectively; a common electrical line; means for electrically connecting all of said photo-detectors to said common line, said connecting means including a pulse generator responsive to the sensing of light by said photo-detectors and having output means for providing output pulses corresponding in number to the weighted scoring values of the photo-detectors; time multiplexing means for successively connecting said common line to said score displays for time periods which are unique to respective score displays and for successively enabling said light sources for time periods which are unique to



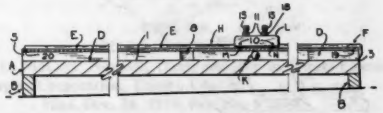
respective guns and which are at least partially concurrent with the time periods of respective score displays.

4,192,508

MAGNETIC BALL GAME

Lester R. Livick, 15106 Beatty St., San Leandro, Calif. 94579

Filed May 3, 1978, Ser. No. 902,438
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—118 A **3 Claims**



1. A device of the type described, comprising:
(a) a rectangular board having a flat upper surface with guide grooves therein large enough in width and depth to permit a ball bearing to move along a desired groove, said grooves extending from one end of the board to the other end, the grooves being open at each board end;
(b) a transparent flat cover plate covering the grooves and the flat upper surface of the game board;
(c) a carriage movably supported by the upper surface of the cover and housing a magnet; and
(d) means for positioning the magnet in said carriage so that the undersurface of said magnet will be disposed a predetermined distance above the upper surface of the cover, said cover separating the magnet from the ball bearing and the magnet exerting sufficient magnetic force on said ball bearing to move it along the groove in which the ball bearing is disposed as the carriage is moved.

4,192,509

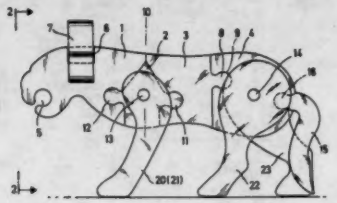
THREE DIMENSIONAL PUZZLE FIGURE

Medilen S. Singh, 208 PCIB Bldg., Greenhills Commercial Center, San Juan Rizal, Philippines

Filed Jan. 30, 1978, Ser. No. 873,361
Int. Cl.[2] A63F 9/12
U.S. Cl. 273—157 R **4 Claims**

1. A puzzle figure comprising a plurality of equally thick, plate-like and partly exchangeable parts, the body thereof consisting of at least one exchangeable head part, two torso parts and one pelvis part which are formfittingly intercon-

nected on one plane, and wherein said pelvis part and one of said torso parts respectively is provided with a borehole perpendicular to the plane of said figure and said one torso part is formed as a mirror image about a perpendicular plane through



said borehole; rods sized for insertion through said boreholes, each of said rods having a length greater than the thickness of said head, torso and pelvis parts; and leg parts movably attachable on said rods, said leg parts being of equal thickness to said head, torso and pelvis parts.

4,192,510

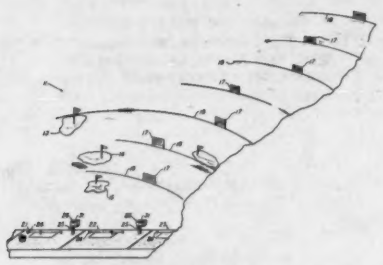
APPARATUS FOR SIMULATING GAME OF GOLF

Franklin C. Miller, 909 Volante Dr., Arcadia, Calif. 91106

Filed Jul. 24, 1978, Ser. No. 927,291

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—176 A **1 Claim**



1. Apparatus for playing a simulated round of golf on a golf practice course and comprising a practice driving range, a plurality of putting practice greens, a tee zone on the driving range, a video screen computer at the tee zone, a changeable computer programming unit adapted to image a golf course hole layout on the screen of said computer, computer controls for imaging a simulated ball on said computer screen, a plurality of approach greens at differing distances from said tee zone and dispersed on said driving range, and distance markers on said driving range indicating distance to said approach greens and distance from said tee zone for measuring the distance of driven golf balls.

4,192,511

PORTABLE MINIATURE GOLF GAME

Denis E. Fitzgerald, 212 S. Kamloops St., Vancouver, British Columbia, Canada (V5K 3T9)

Filed Dec. 7, 1978, Ser. No. 967,191

Int. Cl.[2] A63B *69/36*

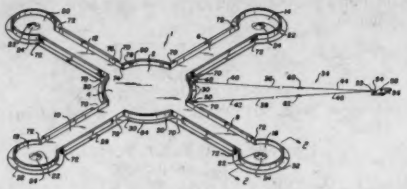
U.S. Cl. 273—176 G **11 Claims**

1. A portable folding golf game comprising:

a flat, flexible putting surface with a circular central fairway, a plurality of elongate fairways extending radially outwards from the central fairway and a plurality of circular greens, one green at the end of each fairway, each green having a central aperture for receiving a golf ball;

a teeing means comprising a flat teeing surface with a golf tee extending upwardly therefrom and bridle means for connecting the teeing surface to the putting surface;

a peripheral barrier surrounding the putting surface, the barrier having gaps between the central fairway and the elongate fairways and between the elongate fairways and the greens to permit folding of the golf game; and



a plurality of detachable barrier extensions for bridging the gaps in the peripheral barrier when the game is in use.

4,192,512

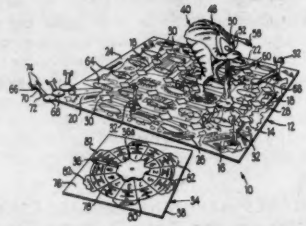
BOARD GAME APPARATUS

Erick E. Erickson, Chicago, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 31, 1978, Ser. No. 874,013

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—243 **19 Claims**



1. A board game comprising:

a gameboard having a playing surface thereon with a travel path defined by a plurality of spaced apart play stations;

a plurality of playing pieces including one for each player adapted to move along said travel path between said play stations;

chance means for directing the movement of each playing piece for an associated player's turn for a chance determined number of play spaces along said path;

a plurality of spaced apart foot spaces on said playing surface arranged in pairs straddling said travel path at several positions thereon; and

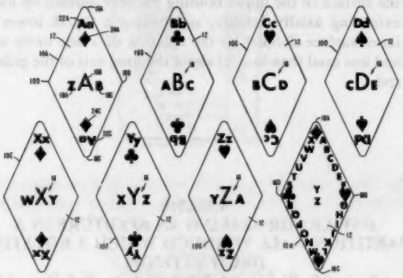
a toy figure having a pair of spaced apart feet adapted to rest on pairs of said foot spaces and including a body supported on a pair of spaced legs extending upwardly of said feet, said body including a pan for holding a quantity of viscous mucous of cohesive, gelatinous material, said pan including at least one opening therein permitting said material to flow downwardly of said pan to contact said playing surface forming a cohesive strand at least partially blocking a path between said spaced legs above said playing surface below said pan.

4,192,513

DIAMOND ALPHABET PLAYING CARDS

John M. Feeley, and Ruth E. Feeley, both of 19333 Plummer St., Northridge, Calif. 91324

Continuation of Ser. No. 722,381, Sep. 13, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 898,716
Int. Cl.[2] A63F 1/02
U.S. Cl. 273—294 17 Claims



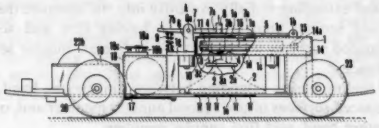
12. Game apparatus comprising
a deck including a plurality of playing cards,
each of said cards having first and second faces,
each of said cards having imprinted on the first face thereof a designation of its value relative to the remaining cards in said deck, said value designation comprising a sequence of three letters imprinted centrally on the first face of each of said cards, the letters forming a natural alphabetic sequence, said cards being divided into four suits, a designation of the suit of each of said cards also being imprinted on the first face of said cards, each of said suits including twenty-six cards, the second letters in said sequences on said cards in each of said twenty-six card suits corresponding to the letters of the alphabet from "A" to "Z".

4,192,514

SOUND REPRODUCING MECHANISM FOR TOYS

Tasuku Ohno, Tokyo, Japan, assignor to Stiron Chemical Industry Co. Ltd., Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,562
Claims priority, application Japan, Sep. 12, 1977, 52-110144
Int. Cl.[2] G11B 3/00
U.S. Cl. 274—1 A 2 Claims



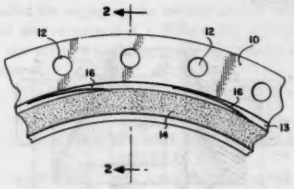
1. A sound reproducing device for toys comprising: a speaker 2 fixed to the inner bottom of a casing 1 in a state where the opening portion of a cone type diaphragm is turned down; a pickup 3 pivoted on the casing through a suitable support member located therein such that, while it permits an upward stylus 4 mounted on a boss 3*c* to be in engagement with a groove, it is caused to move against a return spring 3*b* and the boss 3*c* is caused to be in connection with the speaker 2 during playback operation; an upper lid 5 pivoted 1*b* swingingly on the upper opening 1*a* of the casing 1 and provided rotatably with a turntable 11 on the under face of which a phonograph record is supported; and a mechanism 7*a* for harmonizing stylus pressure in which a lever plate 7 is pivoted 6*a* between support plates 6 and 6 mounted on a stepped portion 1*g* of the casing 4 which is diametrically opposite to the pivoting point 1*b* of the upper lid 5, the front arm 7*a* of the lever plate 7 is snap-fit into a ring 8 mounted on the upper lid 5 and a relatively weak spring 9 is interposed between the rear arm of the lever plate 7 and the upper face of the stepped portion 1*g*.

4,192,515

GASKET RETAINING SPRING

Hosea E. Smith, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 5, 1978, Ser. No. 912,892
Int. Cl.[2] F16J 15/06; F16L 23/02
U.S. Cl. 277—11 4 Claims



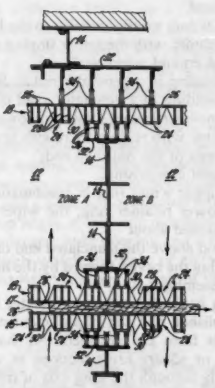
1. A flanged connection comprising a first flanged member containing an annular gasket recess bounded by a wall formed by said recess in said first member, an annular gasket positioned within said gasket recess and having an outer edge located adjacent said wall, a plurality of resilient metallic gasket retainer springs tack welded to said recess wall in said first flanged member and extending within said recess in contact with said edge of said gasket at spaced intervals about said gasket, a second flanged member aligned with said first flanged member and abutting against said gasket, and means for securing said second flanged member to said first flanged member.

4,192,516

SEALS FOR OVENS

Ralph E. McCort, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 26, 1978, Ser. No. 973,467
Int. Cl.[2] F26B 11/02; F16J 15/44
U.S. Cl. 277—12 12 Claims



1. Apparatus comprising:
a. an oven;
b. a baffle positioned within said oven to divide said oven into zones;
c. a first belt mounted for travel through at least two of said zones, said belt having foraminous and non-foraminous portions; and,
d. a plurality of members extending from said baffle across

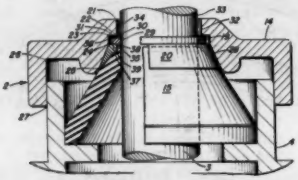
the width of said first belt, said members being positioned so that at all times at least one of said members is in a contact relationship with a non-foraminous portion of said belt.

4,192,517

ANTI-SCALE STUFFING BOX IMPROVEMENT

Julio A. Torres, Pecos, Tex., assignor to Conoco, Inc., Ponca City, Okla.

Filed Feb. 26, 1979, Ser. No. 15,263
Int. Cl.[2] F16J 15/12
U.S. Cl. 277—24 **3 Claims**



1. In combination with a wiper assembly positioned about a reciprocating polished rod; the wiper assembly comprised of a lower housing member, an upper housing member, an upright trunciated conoid elastomeric wiper seal positioned in wiping fit about the reciprocating polished rod, and a means for tightening the upper housing member against the lower housing member in a direction axial to the long axis of the polished rod, the wiper assembly situated upstroke of and fastened to or integral with a stuffing box situated about and in sealing fit with the reciprocating polished rod;

the upper housing member having an internal surface defined by rotating a line 360° about the long axis of the polished rod,

(a) the line starting at the upper surface of the upper housing member in proximity to the polished rod,

(b) then extending downward parallel to the long axis of the polished rod,

(c) then extending outward radially to the long axis of the polished rod,

(d) then extending downward parallel to the long axis of the polished rod,

(e) then extending axially-radially to the long axis such as to be in proximity with the upper sloping axial surface of the trunciated conoid wiper seal,

(f) then extending in a generally radial direction, and

(g) then extending in a generally axial direction; the upper housing member matable with the lower housing member and movable with respect therewith in a direction axial to the long axis of the polished rod;

the improvement comprising:

(h) a rigid upper wiper ring in combination with

(i) a rigid lower retainer ring; the wiper ring and retainer ring positioned about

the polished rod above the trunciated end of the conoid wiper seal and within the cavity formed by the housing members of the wiper assembly;

the wiper ring having an internal diameter in snug slidable fit with the polished rod and of sufficient closeness to scrape any deposits from the polished rod, having substantially rectangular or square cross-sections as viewed in a plane taken radially through the long axis of the polished rod, the radial distance of each cross-section being greater than the total radial distance between the surfaces of the polished rod and the surfaces of the upper housing member defined by rotating line (b) extending downward parallel to the long axis of the polished rod as taken through any radial plane through the long axis of the polished rod, the axial distance of the cross-section being not greater than the axial distance defined by line (d) extending downward parallel to the long axis of the polished rod and not less than about 90 percent of said distance of line (d), the total diameter of the outer surface of the wiper ring not being greater than the diameter defined by rotating line (d) defining an internal surface in the upper housing member;

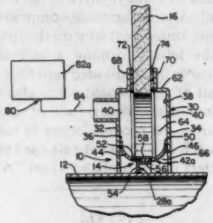
the lower retaining ring having an upper surface radial to the long axis of the polished rod, having an inner surface of greater diameter than the diameter of the inner surface of the wiper ring, having an outer surface substantially nestable in the surface of the upper housing member defined by line (e) extending axially-radially, and having a fourth lower and inner surface defined by the rotation of a line more radial and less axial than line (e) about the long axis of the polished rod.

4,192,518

DEVICE FOR SEALING AN APERTURE IN A PARTITION WALL THROUGH WHICH A ROTATING DRUM EXTENDS

Hans F. Arendt, Bleichinsel, 712 Bietigheim, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 961,065
Int. Cl.[2] F16J 15/38, 15/40
U.S. Cl. 277—27 **24 Claims**



1. A device for sealing an aperture in a partition wall having opposed sides through which partition wall a rotating drum extends, the device comprising:

(a) a first annular member attached to the drum and extending radially outwardly therefrom;

(b) a second annular member attached to the partition wall and extending radially inwardly into the aperture therein, said second annular member having first and second spaced surfaces which partially define an annular sealing space;

(c) sealing means extending between, on the one hand, said spaced surfaces of said second annular member and, on the other hand, said first annular member;

(d) whereby the opposed sides of said partition wall are isolated from each other by said sealing space.

4,192,519

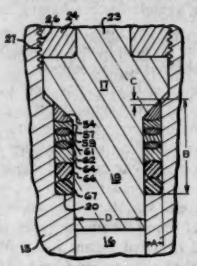
HIGH PRESSURE MULTI-PURPOSE SEAL

Alvin E. Buggele, 7 Milan Manor Dr., Milan, Ohio 44846

Filed Jul. 24, 1978, Ser. No. 927,479
Int. Cl.[2] F16J 15/12
U.S. Cl. 277—115 **16 Claims**

1. An apparatus for achieving a seal between a container defining an enclosed volume and a closure comprising a plurality of axially aligned bands disposed about said closure including a band having a substantially triangular cross section adja-

cent said closure, a first plurality of metallic bands, a second plurality of metallic bands having a double convex cross section interleaved with said first plurality of metallic bands and at least one band having a substantially circular cross section.



4,192,520

SEAL STRUCTURE

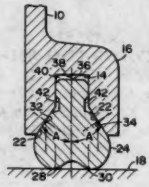
Tadao Hasegawa, Teromachi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 19, 1978, Ser. No. 907,754

Claims priority, application Japan, Jan. 30, 1978, 53-10266[U]

Int. Cl.² F16J *15/12*

U.S. Cl. 277—235 B **8 Claims**



1. A sealing structure including a substantially flat sealing surface, a gasket and a groove formed in a flange facing the sealing surface for the gasket and for applying a sealing force to the gasket in a direction substantially perpendicular to the sealing surface, wherein a groove is formed such that the groove has inclined surfaces with the width of the groove increasing towards the sealing surface and such that the inclined surfaces apply a pressing force to the gasket and wherein contacting points along a cross section of the gasket and the sealing surface are closer to the center of the gasket than are the respective centers of the inclined surfaces in the groove.

4,192,521

4-JAW WORK HOLDING CHUCKS

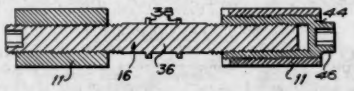
Bernard Smith, 33 Bagshaw Ave., Chapel-en-le-Frith, Via Stockport, Cheshire, England

Filed Sep. 23, 1977, Ser. No. 836,080

Claims priority, application United Kingdom, Oct. 2, 1976, 41017/76; Oct. 7, 1976, 41637/76

Int. Cl.² B23B *31/36, 31/12*

U.S. Cl. 279—112 **9 Claims**



1. A 4-jaw work holding chuck, comprising a body provided with two pairs of oppositely disposed radiating guides, a jaw slidably adjustable along each said guides, a pair of adjusting screws extending diametrically across the body and threadedly connected to oppositely disposed pair of jaws, each adjusting screw having a right hand thread at one end and a left hand thread at its other end whereby, as the screw is turned, the oppositely disposed pair of jaws concerned are adjusted in position with equal and opposite movement, a sleeve located on at least one end of at least one of the adjusting screws between said screw and the associated jaw at said one end, said sleeve being internally screwthreaded for engaging the screwthread at that end of its associated screw and externally screwthreaded for engaging the associated jaw whereby rotation of said sleeve provides a differential adjustment of its associated jaw relative to the opposite jaw independent of said adjusting screw.

4,192,522

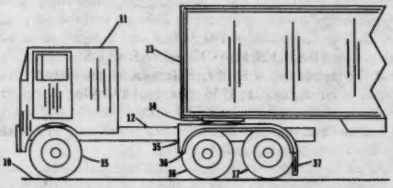
HIGHWAY VEHICLE SPLASH AND SPRAY CONTROL SHIELD

John H. Morgan, 4905 Linda Ave., Baltimore, Md. 21236

Filed Aug. 14, 1978, Ser. No. 933,287

Int. Cl.² B62D *25/16*

U.S. Cl. 280—154.5 R **4 Claims**



1. A device for controlling the discharge of wet weather splash and spray of a highway vehicle comprising a shield consisting of a unit with side walls and a top wall that covers the uppermost forward part, over the top of and the uppermost rearward part of a wheel, or dual wheels, or a set of wheels of adjacent axles, the uppermost forward section of said shield comprising an air collector known as a "scoop", which is aerodynamically designed to collect and direct the flow of air caused by the forward movement of the vehicle, across the top of, backwardly and downward, behind the wheel or wheels or most rearward wheels of a set of adjacent axles, directly to the road surface,

said air scoop utilizing the outer surface of the forward arcuately shaped portion of said shield as its arcuate bottom wall, and having generally triangular side members extending upwardly from the respective side edges of said bottom wall, and a generally horizontal top wall interconnecting the top edges of said side members, said air scoop defining an enlarged front opening and a constricted rear opening through which the flow of air is forcefully directed rearwardly along the top wall of said shield.

4,192,523

LOADER VEHICLES

Winfried Hausmann, Klein-Lobke, Fed. Rep. of Germany, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 752,955, Dec. 20, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 937,306

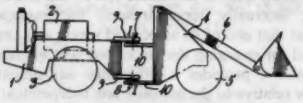
Claims priority, application United Kingdom, Dec. 24, 1975, 52927/75

Int. Cl.² B62D *53/02*

U.S. Cl. 280—400 **3 Claims**

1. An articulated vehicle having two frame sections, one of

which supports the drive unit and the other an implement, said frame sections each including first and second arms with opposed overlapping end portions for mounting first and second hinge joints therebetween to enable steering movement between said frame sections, a first ball and socket bearing for said first joint mounted in a first arm of one of said frame sections, a pin interconnecting said first bearing with the other first arm of said other frame section, means locking said first



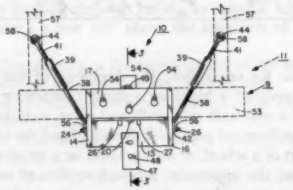
socket bearing against movement in said first arm of said one frame section, a second ball and socket bearing, means defining a bore in the second arm of said one frame section for slidably receiving said second socket bearing therein, a second pin interconnecting said second ball and socket bearing with the second arm of said other frame section, and means connected to said second arm of said one frame and extending across said bore to limit sliding movement of said second socket bearing in one direction.

4,192,524

TRAILER HITCH APPARATUS

Terry B. Twiestmeyer, R.R. #1, Belgrade, Nebr. 68263

Filed Jan. 31, 1978, Ser. No. 873,806
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—415 A **7 Claims**



1. A trailer hitch device for attachment to a bumper plate of a towing vehicle, the vehicle further having frame members disposed distal of said bumper plate, the device comprising:

support frame means for attachment to said bumper plate;

a draw bar means secured to said support frame means; and

elongated linkage means having one end secured to said support frame means and having another end for attachment to said frame members; wherein said support frame means has a horizontally disposed passage formed therethrough from front to rear and said draw bar means is disposed in said passage, said draw bar means having a ball hitch secured thereto, said draw bar means also having at least one opening formed therein for receiving a clevis pin, said support frame means including a reinforced bottom wall, a pair of spaced side walls secured to and projecting upwardly from said bottom wall, and a top wall secured between said sidewalls and spaced from said bottom wall, said bottom wall having said passage formed therethrough and further having a vertical hole drilled therethrough and passing into said passage; and said draw bar means including a drop pin mounted in said vertical hole and one of said draw bar openings, and wherein said support means includes a pair of spaced upstanding tabs secured to the top of said bottom wall with said tabs opposite each other with said vertical hole disposed therebetween, each said tab having a hole formed therethrough; and a locking pin mounted in said tab holes over said drop pin to prevent said drop pin from working out of said vertical hole.

7. A trailer hitch device for attachment to a bumper plate of a towing vehicle, the vehicle further having frame members disposed distal of said bumper plate, the device comprising:

support frame means for attachment to said bumper plate;

a draw bar means secured to said support frame means; and

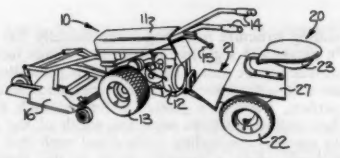
elongated linkage means having one end secured to said support frame means and having another end for attachment to said frame members; wherein said support frame means has a horizontally disposed passage formed therethrough from front to rear and said draw bar means is disposed in said passage, said draw bar means having a ball hitch secured thereto, said draw bar means also having at least one opening formed therein for receiving a clevis pin and wherein said drawbar means has a first end and a second end opposite thereto, and said ball hitch being secured at said first end and said clevis pin openings being formed at said second end, said drawbar means being disposed in said passage in a first position, and then reversed end to end to be disposed in said passage in a second position, in said first position said drawbar being connectable to a trailer by means of said ball hitch, and in said second position said draw bar being connectable to a trailer by means of said clevis pin openings.

4,192,525

STEERING SULKY FOR TWO-WHEEL TRACTORS

John D. Clark, Winston-Salem, N.C., assignor to Clarke-Gravely Corporation, Clemmons, N.C.

Filed Sep. 22, 1978, Ser. No. 944,708
Int. Cl.[2] B62D *53/02*
U.S. Cl. 280—443 **8 Claims**



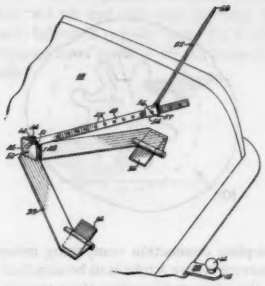
1. In combination, a two-wheel tractor having rearwardly extending handlebar means adapted for guiding the tractor, and a steerable two-wheel trailer articulately connected to said tractor and positioned rearwardly thereof and including means for receiving an operator of the tractor on the trailer in position for grasping said handlebar means and applying a lateral steering force thereto, and said trailer comprising a frame having a forwardly extending tongue pivotally connected to said tractor, a pair of wheels, a pair of wheel mounts pivotally carried by said frame and mounting said wheels for pivotal movement relative to said frame, and linkage means carried by said frame and connected to said wheel mounts and to said tractor and operable for effecting unison pivotal movement of said wheels upon articulative movement between said tractor and said frame as a result of the application of a lateral steering force to said handlebar means during movement of the tractor so as to thereby steer the tractor and trailer assembly in the desired direction while minimizing the steering force required upon the handlebar means and the amount of lateral movement thereof relative to the trailer and while also providing enhanced lateral stability to the tractor and trailer assembly.

4,192,526

TRAILER HITCH GUIDING DEVICE

Casper E. Myers, 1601 Palm Way, Largo, Fla. 33541

Filed Sep. 22, 1978, Ser. No. 944,787
Int. Cl.[2] G01C *5/00*
U.S. Cl. 280—477 **10 Claims**



1. A hitch guide assembly for aligning a pair of coupling members of a hitch used to couple a towing vehicle to a towed vehicle, said hitch guide assembly comprising;

a target post adapted for mounting on the towed vehicle,

a mounted bracket adapted for detachable attachment to said towing vehicle,

an extension arm pivotally connected by an end portion to said mounting bracket for rotation in a plane disposed in substantially perpendicular relationship to said mounting bracket,

a guide pointer secured to said extension arm and capable of longitudinal adjustment along said extension arm,

locking means for securing said guide pointer in a selected fixed position along the longitudinal dimensions of said extension arm,

said mounting bracket having a substantially V-shaped configuration defining a vertex,

said extension arm being pivotally connected at said vertex of said V-shaped mounting arm,

said V-shaped mounting bracket defining two legs with a magnetic fastner being positioned on an end portion of each said leg,

said end portion of said extension arm which is pivotally attached having at least one indicia mark thereon for providing a visual aid to pivotally position said extension arm with respect to said mounting bracket,

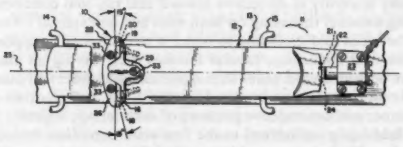
said extension arm disposed in angled relationship relative to said guide pointer.

4,192,527

PIVOT CLIP FOR A SKI BINDING

Douglas L. Replogle, Amherst, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,168
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—618 **3 Claims**



1. In a ski binding having resiliently-loaded holding means operatively interposed between a boot assembly and a ski for releasably holding said boot assembly to said ski and for permitting said boot assembly to separate from said ski in any direction away from said ski, said holding means including at each of three mutually-spaced locations arranged at the apices of an imaginary triangle a concave surface on one of said boot assembly and ski and a convex surface on the other of said boot assembly and ski and contacting said concave surface, the improvement which comprises: a pivot clip mounted fast to one of said ski and boot assembly, said pivot clip including

a first cam surface providing a first of said concave surfaces at a first of said locations arranged on one side of the longitudinal axis of said ski;

a second cam surface providing a second of said concave surfaces at a second of said locations spaced transversely from said first location and arranged on the other side of said longitudinal axis;

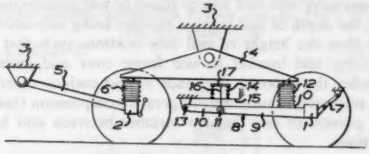
each of said first and second cam surfaces being so inclined such that an external moment applied to said boot assembly about the tibial axis of the skier's leg will produce a reaction force between one of said cam surfaces and its associated convex member, and wherein the longitudinal component of said reaction force will not oppose said applied moment.

4,192,528

SPRING-SUSPENDED BOGIE WITH TWO OR MORE WHEEL AXLES

Lennart Bergquist, Oxelösund, Sweden, assignor to Volvo BM AB, Eskilstuna, Sweden

Filed Jan. 16, 1978, Ser. No. 869,864
Claims priority, application Sweden, Jan. 19, 1977, 7700522
Int. Cl.[2] B60G *5/00*
U.S. Cl. 280—677 **14 Claims**



1. A vehicle truck or bogie comprising:

a chassis having associated therewith at least first and second wheel axles;

at least one pair of balance beams pivotally mounted on said chassis, each said beam having longitudinally spaced first and second ends, said beams being laterally spaced;

interconnecting means, connecting each of said first and second axles to laterally spaced first and second ends of said beams, respectively, for transmitting vertical forces therebetween;

a flexible unit rigidly connected to said first axle and pivotally connected to said chassis;

at least said interconnecting means connecting said first axle to said first ends of said beams comprising substantially vertically extending elements of a construction which are rigid when subjected to substantially vertically directed stresses, but which are flexible and yieldable when subjected to substantially horizontally directed stresses;

said elements being supported by said flexible unit at points thereon which are longitudinally spaced from said first axle, such that a first imaginary vertical plane through said first axle is longitudinally spaced from a second imaginary vertical plane through said points;

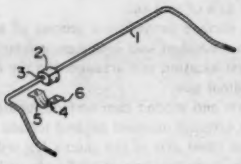
said first axle, upon vertical movement thereof, being pivotable about an imaginary straight line connecting said points, thereby causing flexing of said flexible unit; and

spring means associated with said flexible unit for counteracting said flexing of said flexible unit.

4,192,529
STABILIZER MOUNTING MEANS

Harunori Shiratori, and Kenichi Kikuchi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 18, 1978, Ser. No. 925,782
Claims priority, application Japan, Jan. 30, 1978, 53-9929[U]
Int. Cl.[2] B60G 11/18
U.S. Cl. 280—689 2 Claims



1. A device for mounting a stabilizer on a vehicle frame, comprising:
(a) a substantially tubular cushion member having an axial bore for receiving said stabilizer;
(b) a lobe portion integral with and radially projecting from the peripheral surface of said member at each opposed axial end thereof;
(c) a bracket member for straddling said cushion member and securing it to said frame comprising a U-shaped strap portion and a pair of flanges each having means for attaching said bracket to said frame, one of said pair of flanges extending from a respective one end of said strap portion, said strap portion having an annular recess in the inside surface proximate each opposed axial end thereof for cooperation with said lobe portions of said cushion member, the depth of said annular recesses being substantially less than the height of said lobe portions such that on securing said bracket to said frame over said cushion member the opposed axial ends of said cushion member are subjected to substantially greater compression than is the portion of said cushion member between said lobe portions.

4,192,530
PASSIVE SEAT BELT SYSTEM

Joseph M. Cachia, Detroit, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

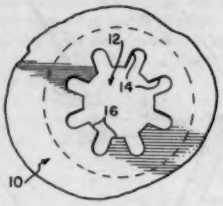
Filed Aug. 29, 1977, Ser. No. 828,450
Int. Cl.[2] B60R 21/02
U.S. Cl. 280—802 10 Claims

1. In a vehicle passive seat belt restraint system including a seat belt adapted to be positioned across and in contact with the torso of the vehicle occupant, the improvement comprising cover means surrounding said seat belt and extending substantially along the entire length of that portion of said seat belt which otherwise would contact the occupant's torso, said seat belt being slideable within the interior of said cover means and said cover means being fixed at one end to a part of said vehicle, whereby the position of said cover means is fixed with respect to said occupant.

4,192,531
TUBE-TO-PLATE CONNECTION

Ronald S. Williams, and Robert S. Hill, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed May 22, 1978, Ser. No. 908,392
Int. Cl.[2] F16L 41/00
U.S. Cl. 285—222 9 Claims

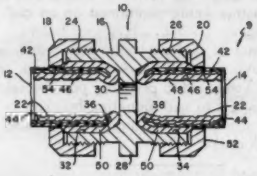


1. A tube-to-plate connection comprising means on a plate defining an aperture where a tube is to be attached to the plate, the region of the plate surrounding the aperture including a flange for receiving the end of the tube, the flange including a proximal end at its junction with the plate and extending away from the plane of the plate to provide at its distal end a plurality of fingers, the tube including a side wall portion lying adjacent the flange, the fingers at the flange distal end being formed to include radially inwardly extending portions and finger distal end portions projecting back toward the plate, the tube end projecting into the spaces formed by the flange and fingers and contacting the radially inwardly extending finger portions, the finger distal end portions being disposed within radially inwardly opening indentations provided in the tube adjacent the tube end.

4,192,532
FLEXIBLE CONDUIT CONNECTOR

Samuel S. Pacella, 14727 Hanfor, Allen Park, Mich. 48101

Filed Jul. 24, 1978, Ser. No. 927,470
Int. Cl.[2] F16L 19/00, 33/00, 33/18, 33/20
U.S. Cl. 285—248 1 Claim



1. A coupling assembly including two sections of flexible electrical conduit, a tubular double-female connector which is open at both ends to receive the ends of both sections of conduit, said connector having a radially inwardly projecting circular rib midway between its ends, the inner surfaces of said connector adjacent said rib on both sides thereof being tapered radially inwardly in directions toward said rib, said connector having external threading on both ends and an external formation between said threading to which a wrench may be applied to turn said connector, tubular ferrules each having an inner sleeve portion and an outer sleeve portion, said inner and outer sleeve portions being connected by a fold, the wall portions of said inner and outer sleeve portions of each ferrule adjacent to said fold being cylindrical in the free state condition thereof, said ferrules being assembled with said respective conduit sections by having the inner sleeve portion of each ferrule fitted into an end of the associated conduit section and the outer sleeve portion thereof extending along the outer surface of said conduit section with said fold extending across the end

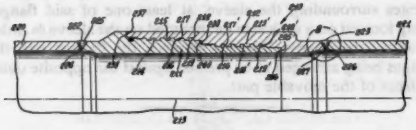
edge of said conduit section, said ends of said conduit sections with said ferrules assembled therewith as aforesaid being inserted respectively in the ends of said connector, and nuts threaded on the threading on the ends of said connector and engaging said outer sleeve portions of said ferrules to clamp said ends of said conduit sections within said ends of said connector under sufficient pressure to cause said folds of said ferrules to abut said rib and said wall portions thereof to be compressed and deformed radially inwardly to frusto-conical form by the tapered inner surfaces of said connector and form a seal therewith.

4,192,533

DOVETAIL CONNECTION FOR PIN AND BOX JOINTS

Thomas L. Blose, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Continuation of Ser. No. 679,476, Apr. 22, 1976, abandoned.
This application Feb. 6, 1978, Ser. No. 875,672
Int. Cl.² F16L *25/00*
U.S. Cl. 285—334 **8 Claims**



1. In a tubular pin member adapted to be coupled to a tubular box member, thereby to form a joint having an axis,

(a) first thread means on the pin member adapted to interfit second thread means on the box member, and third thread means on the pin member adapted to interfit fourth thread means on the box member, said first and third thread means defining a two-step thread,

(b) a first frusto-conical make-up shoulder on the pin member located between said first and third thread means and adapted to interfit a corresponding first make-up shoulder on the box member,

(c) said first and third thread means having flanks angled negatively in axial radial planes, and relative to planes normal to said axis and intersecting said flanks, said flanks facing in one axial direction being negatively angled to lesser extent than the flanks facing in the opposite axial direction, and

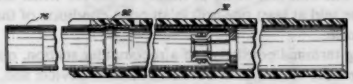
(d) a second frusto-conical make-up shoulder on the pin member proximate the end of one of said first and third thread means remote from said first make-up shoulder, said first and second shoulders being positively angled in axial radial planes and relative to planes normal to said axis and intersecting said shoulders, said second shoulder on said pin member being adapted to be in a spaced relation from a corresponding second shoulder on the box member on normal make-up of said pin member to such box member, said second frusto-conical make-up shoulder on said pin member being adapted to engage the corresponding second shoulder on the box member in the event of sufficient coining of said first frusto-conical make-up shoulder on said pin member and of said corresponding first make-up shoulder on such box member.

4,192,534

HIGH VOLTAGE FUSE HAVING ATTACHED TUBULAR MEMBERS

Joseph Bernatt, Arlington Heights, and Alfred Steegmueller, Skokie, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Division of Ser. No. 741,026, Nov. 11, 1976, Pat. No. 4,075,755.
This application Jan. 4, 1978, Ser. No. 866,929
Int. Cl.² F16L *13/14*
U.S. Cl. 285—382.2 **5 Claims**



1. An improved circuit interrupter of the type which includes a metal tube partially inserted into and extending from an insulator tube, wherein the improvement comprises:

a groove formed in the interior surface of the insulator tube generally perpendicular to the major axis thereof;

a metal tube portion expanded outwardly, radially of both tubes into the groove; and

a slightly expanded area on the exterior of the insulator tube caused by the expansion of the metal tube portion into the groove,

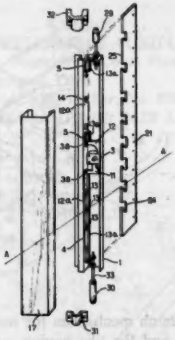
whereby the tubes are attached.

4,192,535

LOCKING MECHANISM

Jacques Picard, 15 Boulevard Flandrin, 75116 Paris, France

Filed Jul. 24, 1978, Ser. No. 927,295
Claims priority, application France, Jul. 26, 1977, 77 22975
Int. Cl.² E05C *1/06*
U.S. Cl. 292—37 **12 Claims**



1. In a lock mechanism for locking a movable member to a stationary member, such as a movable door to a stationary door frame, comprising:

a vertical chamber device connected with said movable door and including at least one U-shaped longitudinal section, said U-shaped section having a base and a pair of longitudinally extending legs having a chamber therebetween;

at least one rod mounted for sliding movement in said chamber longitudinally of said legs;

a locking mechanism associated with said rod and including means to displace said rod longitudinally of said legs;

at least one bolt integrally connected with said rod extending cross-wise within said U-shaped longitudinal section;

each leg of said U-shaped section having at least one longitudinally elongated recess forming at least one pair of recesses, said at least one pair of recesses being aligned

cross-wise of said U-shaped section, said at least one bolt extending through said aligned recesses and having freedom of movement longitudinally within said longitudinally elongated recesses;

A member fastened to said stationary door frame and including a projecting rim projecting beyond said frame and receivable within said chamber in said U-shaped section, said projecting rim having at least one tongue-shaped notch opening at the portion thereof receivable within said U-shaped section and an inclined portion, said at least one notch being aligned with said at least one bolt and being at the level thereof when said rod positions said at least one bolt in an open condition of the lock mechanism;

a plug terminal consisting of a rectangular section, open on one side, closing said vertical chamber device; and,

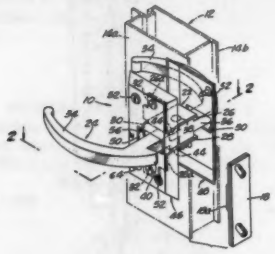
means fastening said plug terminal to said vertical chamber device comprising a longitudinal rim on one side cooperating with a rim set on one of the external legs of said chamber and by means of a gripper on the other side, a longitudinal uncoupling lever cooperating with said gripper, said uncoupling lever being provided on the external face of the other external leg of the chamber.

4,192,536

PUSH-PULL DOOR LATCH

Angel F. Laureano, Bayamon, P.R., assignor to Bel Air Aluminum Manufacturing, Inc., Hato Rey, P.R.

Filed Jul. 13, 1978, Ser. No. 924,238
Int. Cl.[2] E05C *3/30*
U.S. Cl. 292—228 **16 Claims**



1. A push-pull latch mechanism for mounting on a screen door, storm door and the like having a cylindrical opening adjacent its swinging edge extending between opposite facing surfaces thereof, comprising:

(a) a casing frame adapted to fit within the cylindrical opening;

(b) means for securing the casing in an operative position within said opening including casing portions engageable with one of said opposite facing surfaces;

(c) a double-ended handle extending through said casing and being pivoted thereto, said handle having a projecting latch dog in offset relation to the pivot;

(d) means within the casing for urging the handle and latch dog towards a latching position; and

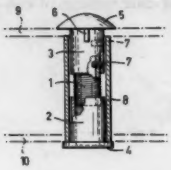
(e) interchangeable inner and outer escutcheon plates securable to the opposite surfaces of the door independently of said casing, said plates respectively having an opening for receiving a handle end therethrough.

4,192,537

SAFETY DEVICE FOR DOORS, WINDOWS AND SIMILAR

Yrjö T. Laine, Niemenmäentie 12 A 26, 00350 Helsinki 35, Finland

Filed Nov. 20, 1978, Ser. No. 963,563
Claims priority, application Finland, Apr. 27, 1978, 78-1318
Int. Cl.[2] E05C *17/36*
U.S. Cl. 292—264 **5 Claims**



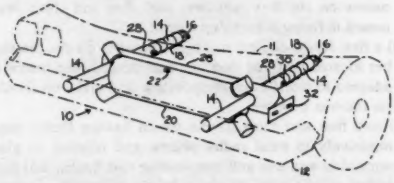
1. A safety device for doors, windows and similar, comprising a locking device attached to a movable part and comprised of a cylindrical housing a pin placed in the housing and a locking means for locking the pin in the housing in a certain turning position, and further comprising a safety chain or similar, attached to the outer end of the pin, the other end of said chain being attached to an immovable part, such as a frame, and said housing being provided with means for attaching it to said movable part, the improvement comprising that the housing is made of a sleeve provided with an outer thread and that the fixing means of the housing is comprised of two flanges surrounding the sleeve, at least one of said flanges being located on a socket to be threaded on the sleeve in order to adjust the relative distance between the flanges, and the flanges being arranged to be pressed against the opposite outer surfaces of the movable part.

4,192,538

BUMPER CONSTRUCTION FOR MOTOR VEHICLES

Frank Gulli, 62 Livingston Ave., Dobbs Ferry, N.Y. 10522

Filed Apr. 21, 1978, Ser. No. 898,928
Int. Cl.[2] B61F *19/04*
U.S. Cl. 293—134 **1 Claim**



1. Improved bumper construction for motor vehicles comprising first and second bumper members, said second bumper member having means for mounting the same to the frame of a vehicle, said first bumper member slideably carried on said second bumper member, a flexible air container means disposed between said bumper members, yieldable means associated with said bumper members for yieldably urging said first bumper member inwardly in respect to said second bumper member and against said air container means, said air container means having an air inlet valve and air outlet valve means, whereby, in the event of collision of said vehicle in which said first bumper member is forced inwardly thereof, air escapes from said air container means at a controlled rate to absorb the energy of said collision, each said bumper member having a pair of pipes extending perpendicularly inwardly thereof, the pipes of said first bumper member slideable in the pipes of said second bumper member, said air container means being an

elongated cylindrical air bag of a length substantially equal to the distance between the pipes of said first bumper member, said bumper members being oppositely concave in shape to conform to the cylindrical shape of said air bag.

4,192,539

STAND-UP TRASH RETRIEVING AND DUMPING DEVICE

Marshall W. Broyles, 201 Lincoln Ave., and Charles D. Schrader, 119 E. Monroe St., both of Alexandria, Ind. 46001

Filed Jul. 28, 1978, Ser. No. 929,163
Int. Cl.[2] B25J *1/00*
U.S. Cl. 294—19 R **8 Claims**

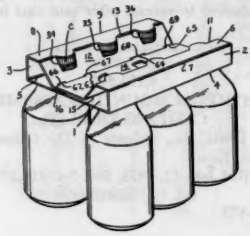
1. A stand-up device for retrieving an object from a generally flat surface and thereafter dumping the same comprising: an elongated member including a handle element having opposite ends and a generally flat spatula element extending from one end of said handle element and defining an obtuse angle therewith; an arm element having an inner end pivotally mounted on said spatula element adjacent said one end of said handle element, said arm element comprising an elongated member formed of flat strip material, said arm element being movable between a first closed position cooperating with said spatula element selectively to grasp an object therebetween, and a second open position spaced from said spatula element for dumping said object, said arm element having an outer end engaging said spatula element in said closed position and having an outwardly curved portion between said ends thereof thereby to grasp an enlarged object, said arm element having a hook portion integral therewith extending outwardly from said outer end adapted to be engaged with an abutment thereby to move said arm element to said open position thereof; a leaf spring having opposite ends with one end engaging said handle element adjacent said one end thereof and the other end engaging said arm element for normally biasing said arm element toward said closed position thereof; and an elongated flexible element guided by said handle element and having opposite ends with one end attached to said hook portion of said arm element and its other end having manually actuated pulling means thereon adjacent the other end of said handle element for moving said arm element to said open position.

4,192,540

ARTICLE CARRIER BLANK

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 21, 1978, Ser. No. 962,611
Int. Cl.[2] B65D *71/00*; B66F *19/00*
U.S. Cl. 294—87.2 **8 Claims**



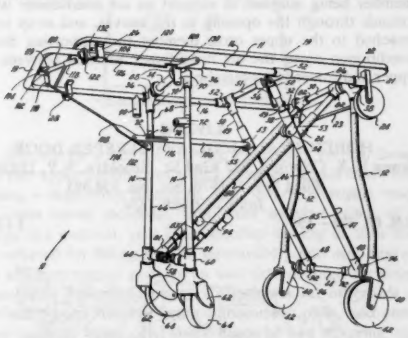
1. An article carrier blank comprising a bottom panel (1), a pair of side panels (2,3) foldably joined respectively to the longitudinal side edges of said bottom panel, a pair of top panels (6,8) foldably joined respectively to the longitudinal edges of said side panels remote from said bottom panel, a neck receiving aperture (40–45) formed in said bottom panel, a transverse retention tab (47) foldably joined to said bottom panel along a V-shaped fold line (52) and disposed in said neck receiving aperture, and characterized in that a medial bend line (57) is formed in said transverse retention tab and a bend line extension (59) is formed in said bottom panel and is disposed in alignment with said medial bend line and a pair of auxiliary bend lines (60,61) are formed in said bottom panel and extend from the ends of said V-shaped fold line and are disposed substantially parallel to said bend line extension.

4,192,541

CART HAVING EXTENSIBLE AUXILIARY WHEELS

Richard H. Ferneau, Washington Court House, Ohio, assignor to Burt Weil, Cincinnati, Ohio

Filed Feb. 8, 1978, Ser. No. 875,994
Int. Cl.[2] A61G *1/02*; B62B *3/02*
U.S. Cl. 296—20 **14 Claims**



1. A cart comprising in combination:
a generally horizontal frame,
a platform mounted on said frame for supporting an article,
forward and rearward legs depending from said frame and having wheels at their lower ends,
auxiliary wheels mounted at the forward end of said frame, said auxiliary wheels normally disposed adjacent to said forward legs,
means mounting said auxiliary wheels to said frame to per-

mit said auxiliary wheels to be slidably projected a substantial distance forward of said forward legs,

releasable means normally fixing said legs in perpendicular relation to said frame, and

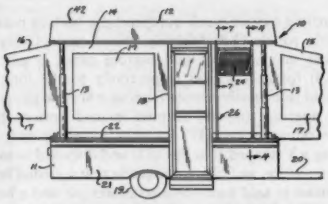
an operator mounted on said frame for releasing said releasable means to permit said legs to swing rearwardly to a folded position beneath said frame when said auxiliary wheels are projected forwardly and are resting on a vehicle deck as the cart is thrust into a vehicle, said auxiliary wheels adapted to retract after said cart is thrust into a vehicle.

4,192,542

AIR CONDITIONER MOUNTING ASSEMBLY FOR A CAMPING TRAILER

Max L. Hill, Listie, Pa., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jun. 12, 1978, Ser. No. 914,377
Int. Cl.[2] B60H *1/00*
U.S. Cl. 296—173 **9 Claims**



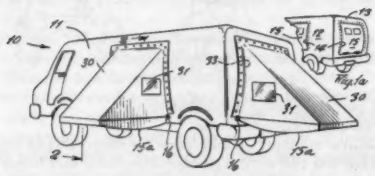
4. An air conditioner mounting assembly for a camping trailer, the camping trailer having a side wall, a top above the side wall, and a canvas sheet extending between the top and the side wall, the canvas having an opening therein through which an air conditioner can extend, the mounting assembly comprising a generally vertically extending frame supported by the side wall and extending upwardly to the top, the frame including a pair of horizontally extending vertically spaced upper and lower cross members adjacent the opening in the canvas and a pair of vertically extending horizontally spaced frame members which extend upwardly from the side wall to the top, the cross members extending between the vertically extending frame members and being secure thereto, the lower cross member being adapted to support an air conditioner which extends through the opening in the canvas, and strap means attached to the upper cross member for supporting the air conditioner when the air conditioner extends between the upper and lower cross members.

4,192,543

HORIZONTAL AUXILIARY SLEEPER DOOR

James F. X. Crawford, 533 62nd St., Brooklyn, N.Y. 11220

Filed Sep. 1, 1978, Ser. No. 938,881
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—159 **1 Claim**



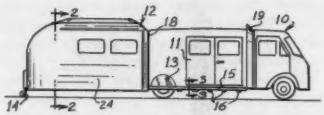
1. An automotive camper with auxiliary sleeping area, comprising in combination, a camper box-like body including opposite side walls and a rear wall, a doorway opening in said walls, a door in each said doorway opening, said door being pivotable about a hinge along its lower edge, and between a vertical and an outwardly horizontal positions, and a detachable canopy over said door in said horizontal position to form said auxiliary sleeping area, wherein a stationary, vertical channel at each side end of said doorway opening supports a hydraulic shock absorber and a lock arm to said door, and a winch mounted on said channel including a reel having a cable connected to an upper corner of said door, wherein said canopy is secured by snap fasteners around an edge of said doorway opening, said canopy being shaped to rest upon said cables connected to said door.

4,192,544

TELESCOPING EXTENSION FOR VEHICLES

Lewis K. Patterson, 4025 Pine Ridge Dr., Lilburn, Ga. 30247

Filed Jul. 3, 1978, Ser. No. 921,741
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—165 **7 Claims**



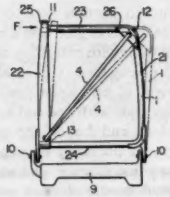
1. A telescoping vehicle extension for mounting on a vehicle having a vehicle body, generally parallel side walls, and a roof, said vehicle extension comprising a vehicle extension body having generally parallel side walls, said side walls of said vehicle extension being spaced outwardly of said side walls of said vehicle for defining storage spaces between said side walls of said vehicle and said side walls of said vehicle extension, rail means carried by said vehicle generally longitudinally of said vehicle, bearing means carried by said vehicle extension generally longitudinally of said vehicle extension for reciprocal engagement with said rail means, the arrangement being such that said vehicle extension is selectively extendible rearwardly of said vehicle and telescopable over said body of said vehicle, and further including a floor for said vehicle extension, said floor for said vehicle extension being pivotal mounted on to at least one of said side walls of said vehicle extension for selective disposition in a generally horizontal position for use as a floor and in a generally vertical position for storing within one of said storage spaces in the retracted position.

4,192,545

SEAT-BACK FRAME FOR AN AUTOMOTIVE VEHICLE

Kazuo Higuchi, Tokyo, and Katsuhiko Matsumoto, Kunitachi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1978, Ser. No. 944,395
Claims priority, application Japan, Sep. 29, 1977, 52-129988
Int. Cl.[2] B60R *21/10*
U.S. Cl. 297—216 **7 Claims**



1. In a seat-back frame for an occupant seat in an automotive vehicle which comprises a generally rectangular frame having generally vertical side rails and generally horizontal upper and

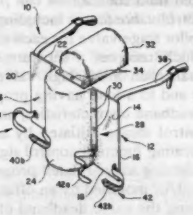
lower rails defining upper and lower corners beween adjacent rails and a seat belt having an end anchored to said frame at one upper corner thereof, the improvement comprising a tensile member connected to and extending between one of said upper corners and a diagonally opposed lower corner of said frame, said tensile member being bowed in the backward direction of said seat-back so as not to cause interference with a cushioning material and cushioning springs when they are pushed backward by an occupant of the seat and sufficiently flexible to straighten in response to rhomboidal deformation of the frame in the direction in which the tensile member tends.

4,192,546

WHEELCHAIR ABDUCTION PILLOW

Margaret B. Smith, 1215 Kent Rd., Raleigh, N.C. 27606

Filed Aug. 7, 1978, Ser. No. 931,300
Int. Cl.[2] A62B *35/00*; A47C *31/00*
U.S. Cl. 297—466 **10 Claims**



1. A wheelchair abduction pillow adapted to be utilized in conjunction with a wheelchair of the type having a seat, a footrest, and support members depending downwardly for supporting said footrest, where said wheelchair abduction pillow maintains a sitting patient's legs in a proper position and generally prohibits the patient's legs from being drawn inwardly and underneath the seat area of the wheelchair; said abduction pillow comprising: a back leg retaining means adapted to be positioned between the seat area and footrest of said wheelchair so as to generally close the area about the lower front portion of the wheelchair below said seat area for preventing a patient's legs from being drawn into the area below said seat area; divider cushion means secured to said back leg retaining means and extending generally vertically thereacross to define a leg retaining area about each side thereof, said divider cushion means projecting forwardly from said leg retaining means for effectively dividing the patient's legs and preventing the patient's knees from crossing over the area occupied by said cushion means.

4,192,547

ROCKING CHAIR FRAME

James M. Geier, 2 Howard St., Burlington, Vt. 05401

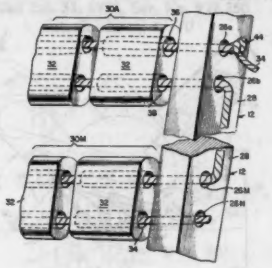
Continuation-in-part of Ser. No. 758,584, Jan. 12, 1977. This application Aug. 3, 1977, Ser. No. 821,517
Int. Cl.[2] A47C *7/02, 3/02*
U.S. Cl. 297—452 **10 Claims**

1. A chair for receiving a person comprising:

(a) first and second support members each having a back support portion extending generally vertically and a seat support portion extending generally horizontally, and a series of holes extending along the lengths of said back and seat support portions;

(b) means disposed between said first and second support portions for fixedly supporting said first and second support members in a substantially parallel relationship with each other; and

(c) support surface means comprising flexible rope means for suspending blocks in a plurality of rows thereof, each block being made of a hard material, each row comprised of a plurality of blocks extending between said first and second support members in a direction substantially perpendicular to the length ofthe person sitting in the chair and suspended at each end by said support members, and each of said blocks having an opening therethrough for receiving said rope means, and being of a small dimension



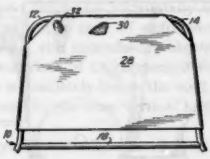
relative to a lateral dimension along the direction of the person and being loosely suspended upon said rope means to move freely therewith, whereby each row of blocks provides a surface flexible in said direction and conforming to the body of the person sitting in the chair.

4,192,548

APPARATUS AND METHOD FOR RECONSTITUTING SEAT BACKS

Amos Williams, 70 S. 29th St., Wyandanch, N.Y. 11798

Filed Dec. 5, 1977, Ser. No. 857,393
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—452 **5 Claims**



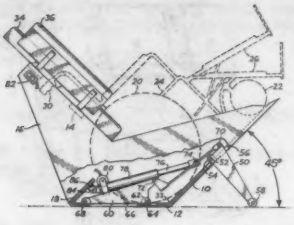
1. A cover for a seat back having a generally vertical frame with two upper corners and a back member on said frame and defining a depression therewith, said cover comprising inner and outer cover members, said inner member being of a sponge-like material, said inner member having at least one side adapted for fitting at least substantially into said depression and two corner pockets on said side adopted for being draped over the upper corners of said frame, the other side of said inner cover member being substantially open, said outer cover member being of a plastic material and covering said inner member and forming therewith a downwardly opening mouth to facilitate mounting the cover over said frame and back member, said outer cover member and said inner cover member being laminated together, said cover member being formed of two sides and an interconnecting edge, said edge being provided with recesses extending into said sides adjacent said mouth to form facing flaps which are adapted for interconnection thereby to facilitate closing the outer cover member around said frame.

4,192,549

WEEELCHAIR TILT CRADLE

John F. Petersen, 9911 SE. Mt. Scott Blvd., Portland, Oreg. 97266

Filed Aug. 14, 1978, Ser. No. 933,153
Int. Cl.[2] A47C *31/00, 13/00*
U.S. Cl. 297—464 9 Claims



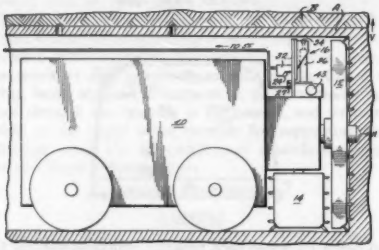
1. A wheelchair tilt cradle, comprising an angular frame forming two sections disposed angularly with respect to each other and arranged to removably support a wheelchair, the frame being adjustable angularly to place each section selectively in engagement with an underlying floor, whereby in one of said adjusted positions a wheelchair patient is disposed in a substantially upright sitting position and in the other said adjusted positions the wheelchair patient is disposed in a rearwardly tilted, reclining position.

4,192,550

REFLECTED LIGHT DETERMINATION OF GEOLOGICAL STRATA

John W. Heimaster, Charleston, S.C., assignor to Coaltex, Inc., Beckley, W. Va.

Filed Jun. 23, 1978, Ser. No. 918,693
Int. Cl.[2] E21C *35/08*
U.S. Cl. 299—1 27 Claims



1. A method of mining a desired geological stratum from surrounding undesired geological strata, the desired and undesired strata having different light reflecting properties, utilizing a mining machine, said method comprising the steps of

boring in a first generally horizontal direction into the desired geological stratum with the mining machine,

progressively penetrating the desired geological stratum with the mining machine while effectively measuring the distance of the mining machine from the undesired strata in a second generally vertical direction generally perpendicular to said first direction, said measuring being accomplished by taking advantage of the different light reflecting properties of the desired stratum and the surrounding undesired strata, and

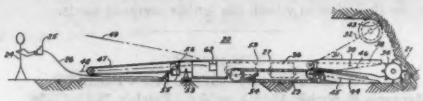
controlling the direction of boring based on the received measurements so that the machine generally stays within the desired stratum.

4,192,551

REMOTE CONTROL SYSTEM FOR MINING MACHINES

James C. Weimer; William S. Locks, both of Bethlehem; Edwin B. Wilson, Quakertown, and Francis G. Miller, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 10, 1978, Ser. No. 949,911
Int. Cl.[2] E21C *35/24*
U.S. Cl. 299—1 27 Claims



15. A mining machine system for remotely controlling one or more fluid-powered machine operating functions, said system comprising:

(a) a pressurized fluid source,

(b) electro-control valve means including a hydraulic servo-controlled pilot stage valve for each machining operation function which receives a separate operating function control signal, each pilot stage valve connected to the fluid source and to a load having proportional flow and-/or valve deadband characteristics, and

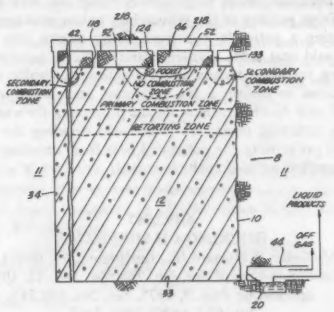
(c) remote control means initiated by an operator for the separate operating function control signals, at least one of said signals having valve-related proportional flow characteristics and/or modified by an offset signal component for overcoming the valve deadband characteristic.

4,192,552

METHOD FOR ESTABLISHING A COMBUSTION ZONE IN AN IN SITU OIL SHALE RETORT HAVING A POCKET AT THE TOP

Chang Y. Cha, 1904 Glenmont Dr., Bakersfield, Calif. 93309

Filed Apr. 3, 1978, Ser. No. 892,451
Int. Cl.[2] E21C *41/10*; E21B *43/24*
U.S. Cl. 299—2 58 Claims



1. A method for retorting oil shale in an in situ oil shale retort in a subterranean formation containing oil shale, the retort having a top boundary of unfragmented formation and containing a fragmented permeable mass of formation particles, wherein a portion of the top of the fragmented permeable mass is separated from the top boundary, and another portion of the top of the fragmented permeable mass is proximate to the top boundary to thereby form at least one pocket intermediate the fragmented permeable mass and the top boundary, the method comprising the steps of:

igniting oil shale in a first portion of the fragmented permeable mass which is proximate to the top boundary and laterally separated from said pocket to establish a combustion zone in said first portion;

introducing to the combustion zone in the first portion a retort inlet mixture comprising oxygen for propagating the combustion zone across an upper portion of the fragmented permeable mass; and

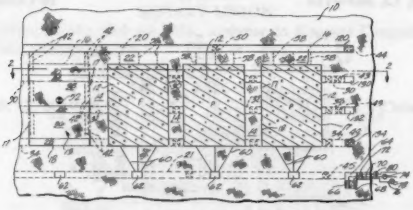
introducing to such pocket under a pressure greater than the pressure in the fragmented mass adjacent such pocket a fluid having a temperature less than the temperature at which unfragmented formation of the top boundary would slough into such pocket and at a sufficient rate of flow to prevent thermal sloughing of unfragmented formation from the top boundary into such pocket such that there is a flow of the fluid out of the pocket and into the fragmented mass.

4,192,553

METHOD FOR ATTENUATING SEISMIC SHOCK FROM DETONATING EXPLOSIVE IN AN IN SITU OIL SHALE RETORT

Irving G. Studebaker, and Richard Hefelfinger, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 3, 1978, Ser. No. 892,736
Int. Cl.² E21C *41/10*
U.S. Cl. 299—2 **17 Claims**



1. A method for attenuating the effects of seismic shock produced by detonating explosive in a subterranean formation containing oil shale for forming a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort, the method comprising the steps of:

forming a permeable seismic shield containing a fragmented permeable mass of formation particles;

excavating at least one void in formation containing oil shale within an in situ oil shale retort site, leaving a remaining portion of unfragmented formation within the retort site adjacent such a void;

placing explosive in such a remaining portion of unfragmented formation;

placing equipment to be protected from seismic shock in underground workings spaced a selected distance from the in situ oil shale retort site, such equipment being sufficiently sensitive to seismic shock that it could be damaged if subjected to a seismic shock wave traveling straight to such equipment the selected distance through unfragmented formation from detonation of such explosive, the seismic shield being located at least in part in a direct line between such equipment in the underground workings and the in situ oil shale retort site; and

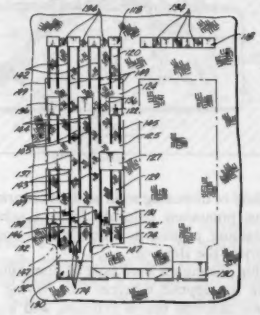
detonating such explosive for explosively expanding such remaining portion of unfragmented formation toward such a void for forming a fragmented permeable mass of formation particles containing oil shale in the in situ oil shale retort, such explosive expansion producing a seismic shock wave at least a portion of which travels through the permeable seismic shield for attenuating the shock velocity and magnitude of the seismic shock wave prior to the shock wave reaching unfragmented formation in the vicinity of the underground workings containing such equipment.

4,192,554

METHOD FOR EXPLOSIVE EXPANSION TOWARD HORIZONTAL FREE FACES FOR FORMING AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 31, 1978, Ser. No. 929,250
Int. Cl.² E21C *41/10*
U.S. Cl. 299—2 **57 Claims**



1. A method for recovering liquid and gaseous products from an in situ oil shale retort formed in a retort site in a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, comprising the steps of:

excavating formation from within the retort site for forming at least one void extending horizontally across the retort site, leaving an upper zone of unfragmented formation within the retort site immediately above the void, and leaving a lower zone of unfragmented formation within the retort site immediately below the void, the lower zone having substantially the same vertical height as the upper zone;

placing explosive in mutually spaced apart vertical upper blast holes in the upper zone of unfragmented formation, and placing explosive in mutually spaced apart vertical lower blast holes in the lower zone of unfragmented formation;

initiating detonation of explosive in each of the upper and lower blast holes in a single round, such detonation being initiated at substantially the same vertical distance from the void for explosively expanding substantially the same amount of formation from the upper zone downwardly toward the void that is explosively expanded from the lower zone upwardly toward the void for forming a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort;

establishing a retorting zone in an upper portion of the fragmented mass;

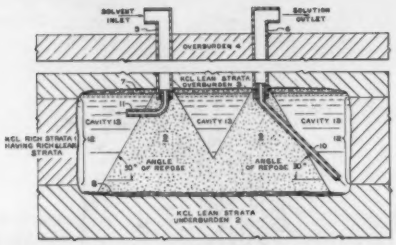
introducing a retorting gas into the fragmented mass for sustaining the retorting zone and for advancing the retorting zone through the fragmented mass; and

withdrawing liquid and gaseous products of retorting from a lower portion of the fragmented mass on the advancing side of the retorting zone.

4,192,555
METHOD OF DISPOSING SOLID SODIUM CHLORIDE WHILE SELECTIVELY SOLUTION MINING POTASSIUM CHLORIDE

Boyd R. Willett, Denver, Colo., assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Aug. 22, 1978, Ser. No. 935,821
Int. Cl.[2] E21B *43/28*
U.S. Cl. 299—4 13 Claims



11. A method of disposing solid sodium chloride while selectively mining potassium chloride from a subterranean can deposit containing potassium chloride and sodium chloride which comprises the steps of:

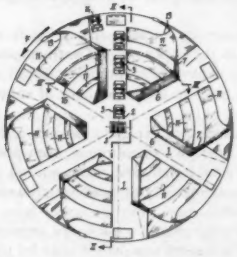
(A) injecting through a bore hole in communication with a cavity in the deposit wherein face having rich and lean potassium chloride ore is exposed, and aqueous solvent saturated with respect to sodium chloride and unsaturated with respect to potassium chloride, thereby depositing sodium chloride from the solvent solution while dissolving potassium chloride; and

(B) withdrawing from the cavity through a bore hole in communication therewith a solution enriched in potassium chloride.

4,192,556
TUNNEL BORING MACHINES

Carlo Grandori, Rome, Italy, assignor to The Robbins Company, Seattle, Wash.

Continuation of Ser. No. 761,351, Jan. 21, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 934,978
Claims priority, application Italy, Feb. 2, 1976, 47913 A/76
Int. Cl.[2] E21D *9/04, 9/08*
U.S. Cl. 299—56 6 Claims



1. A tunneling machine cutterhead of the rotary type which in use is advanced in a direction coincident with its axis of rotation, said cutterhead comprising:

a plurality of forwardly directed cutters having cutting portions for cutting concentric kerfs in a tunnel face,

a plurality of passageways through which excavated materials pass,

a rigid grid structure having a plurality of tunnel face contacting, radially spaced apart breasting rings, said breasting rings being concentric with the axis of rotation of the cutterhead and defining the forward face of the cutterhead,

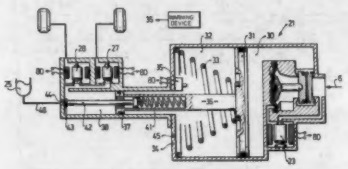
said radially adjacent breasting rings defining annular openings radially between them of a width corresponding to the optimun dimention of fragments of excavated material, said breasting rings being positioned such that all excavated material must pass through a said opening before entering a said passageway,

said cutters being mounted on said cutterhead rearwardly of said grid structure so that the cutting portion of each of said cutters projects slightly forwardly of said breasting rings to permit said breasting rings to support the tunnel face as said cutter cutting portion penetrates into the tunnel face.

4,192,557
PNEUMATIC-HYDRAULIC BRAKE SYSTEM FOR VEHICLES

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,632
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1977, 2726640
Int. Cl.[2] B60T *8/04*
U.S. Cl. 303—114 10 Claims



1. In a pneumatic-hydraulic brake system for vehicles having hydraulic wheel cylinders and a foot-operated brake valve, the improvement comprising:

at least one pneumatic-hydraulic pressure modulator connected to the hydraulic wheel cylinders and to the brake valve, said brake valve controlling the application of operating air to the pressure modulator;

at least one multiple-way air valve connecting the pressure modulator to the brake valve; and

at least one hydraulic valve connecting the pressure modulator to the wheel cylinders, wherein the pressure modulator, the air valve and the hydraulic valve serve as an anti-lock device.

4,192,558
SELF-LUBRICATING BEARING

Elman E. Wade, Ruffsdale, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 748,352, Dec. 7, 1976, Pat. No. 4,113,558. This application Sep. 28, 1977, Ser. No. 837,068
Int. Cl.[2] F16C *17/00, 1/24*; G21C *19/20*
U.S. Cl. 308—6 R 4 Claims

1. A bearing comprising:

an inner race mounted on an axle;

rolling element bearings disposed in said inner race;

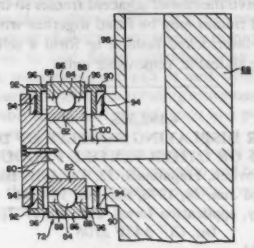
an outer race disposed around said inner race and enclosing said roller element bearings between said inner and outer races, said roller element bearings allowing said outer race to rotate relative to said inner race;

alignment means disposed on said axle and adjacent said outer race for maintaining alignment of said outer race with respect to said inner race while allowing rotation of said outer race;

a reservoir disposed in said axle capable of being filled with

lubricant when said axle is submerged in a lubricant pool; and

supply means establishing fluid communication between said reservoir and said roller element bearings for supplying



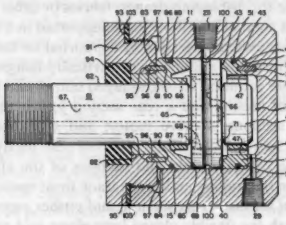
said lubricant to said roller element bearings, said lubricant flowing between said outer race and said alignment means establishing an outward flow of said lubricant thereby preventing impurities from seeping inward.

4,192,559

ROTARY UNION

William Hewitt, Bel Air, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 900,919
Int. Cl.[2] F16C *17/02*
U.S. Cl. 308—36.1 **7 Claims**



1. A rotary union for connection to a rotating element which rotates with respect to said union which comprises:

(a) a housing defining a generally circular chamber;

(b) inlet means for continuously receiving a pressure influenced fluid with lubricating capacity into said chamber;

(c) a rotating shaft rotatably mounted in said chamber, said shaft being rotatably supported within said chamber, said shaft extending axially within said chamber and beyond said chamber, said rotating shaft having a first and second port which ports feed into each other, said first port aligned to receive said fluid from said inlet means, said second port aligned to discharge said fluid to said rotating element suitably affixed to said shaft;

(d) support means stationarily mounted in said chamber, rotatably supporting said shaft;

(e) lubricating means for continuously lubricating said rotating shaft and relieving said union of excess internal heat, said lubricating means to provide a flow passage for a portion of said fluid within said chamber between said shaft interfaced with said support means and said chamber wall, said lubricating means in communication with said inlet means, deriving a portion of said fluid from seepage between said inlet means and said first port;

(f) outlet means for continuously discharging that portion of said fluid utilized as a lubricant within said chamber, said outlet means in communication with said lubricating means; and

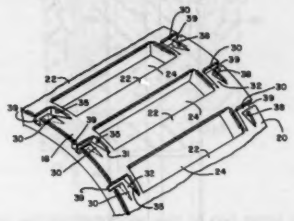
(g) means for sealably enclosing said chamber and allowing said shaft to be attached to said rotating element.

4,192,560

BEARING WITH BEARING CAGE

Michael J. Hartnett, Litchfield, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 21, 1978, Ser. No. 935,350
Int. Cl.[2] F16C *33/66*
U.S. Cl. 308—187 **15 Claims**



1. A bearing comprising: a first race; a second race spaced from the first race; a cage located in the space between said races and normally spaced from both the first race and the second race, said cage having a plurality of circumferentially spaced rolling member pockets; rolling members located in said pockets, said cage being rotated by the rolling members in response to relative rotation of the first race with respect to the second race; fluid in the space between said two races; said cage having a plurality of generally wedged-shaped recesses, each recess having at least one opening at its deep end, the opening at said deep end being located so that during cage rotation in a particular direction, fluid is scooped into the recess and wedged at the shallow end of its recess between the cage wall and a cage piloting surface so that during rotation of the cage, any force tending to move the cage from said normally spaced position into contact with said cage piloting surface is automatically opposed by a hydrodynamic force acting to keep the cage out of such contact.

4,192,561

STORAGE CONTAINER FOR ROLL TISSUE PAPER

Joann Gunn, 32299 Susilane, Roseville, Mich. 48066

Filed May 24, 1978, Ser. No. 908,813
Int. Cl.[2] A47F *1/00*; B65D *85/66*
U.S. Cl. 312—42 **1 Claim**

1. A portable storage container for storing roll tissue paper of the type rolled about a tubular core, said container comprising:

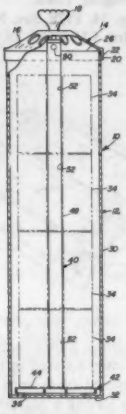
an upright housing having a circular side wall and a bottom wall enclosing the bottom of said housing;

a vertically raised circular ridge located on and integral with the inside surface of said bottom wall at a position radially, inwardly spaced from said circular side wall, said housing having an opening at its top which is sized to receive a roll of tissue paper;

a roll tissue paper holder having a post sized to be received in and extend through the tubular cores of said roll tissue paper;

a circular base made from a plastic material, said circular base being attached at its center to one end of said post, said base being sized larger than said tubular cores and smaller than said housing circular wall, said circular base comprising a central core section to which said post is attached, said core section having a plurality of radially extending spokes integral therewith and an outer ring member, the outer ends of said spokes being integrally connected to the inner surface of said ring member, said post being of a length to receive and support a plurality of

stacked and aligned roll tissue paper, said holder being received within said container with said plurality of tissue being maintained in alignment by said post and supported by said holder base while said holder base is positioned above said housing bottom wall by the abutting engagement of the bottom of said spokes with said raised circular ridge, said post being of such a length as to extend above



the housing top opening a sufficient distance to permit the user to grasp said post and remove same along with said tissue from said housing when said base is positioned on said housing bottom wall;

means at the top of said post for facilitating grasping the same; and

a cover releasably attached to said container to enclose the top of said container.

4,192,562

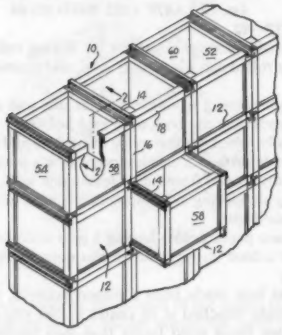
INTERFITTING AND REMOVABLE MODULAR, FRAME, STORAGE UNITS

Mark L. Bishoff, 10331 Wilde Lake Ter., Columbia, Md. 21043, and Theodore Bishoff, 4701 Willard Ave., Apt. #1022, Chevy Chase, Md. 20015

Filed Aug. 22, 1978, Ser. No. 935,966

Int. Cl.[2] A47B *87/00, 47/00, 88/04*

U.S. Cl. 312—108 **20 Claims**



1. A modular storage unit kit, comprising a set of four longitudinal, four vertical, and four cross bars, adapted to be secured together to form an open three dimensional frame, each of said longitudinal, vertical and cross bars of the set being formed with a notch extending from end to end along one edge of the bar, said notch having perpendicular sides adapted to seat and secure panels forming walls of the storage unit, said longitudinal bars each having longitudinal ribs and longitudinal recesses, the rib protruding from one side and the notch being formed in the opposite side, said recess being formed in a third side, the recesses of one frame being of a size and shape to slideably receive the ribs of adjacent frames so that a plurality of assembled frames may be fitted together with their ribs and recesses in interlocked fashion to form a self sustaining structure having slideable, removable units.

4,192,563

DEVICE FOR DISPLAYING SAMPLES OF DRAPES, FABRICS OR OTHER TEXTILE PRODUCTS

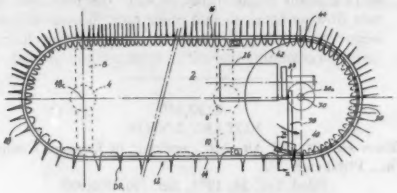
Shimon N. Levkovitch, Hapalmach 32, Tel Aviv, Israel

Filed Jun. 28, 1978, Ser. No. 919,986

Claims priority, application Israel, Jun. 30, 1977, 52418

Int. Cl.[2] A47F *3/08*

U.S. Cl. 312—134 **9 Claims**



1. A device for displaying drapes, fabrics or other products, comprising: a rigid closed loop track supported in a horizontal plane a flexible closed loop slidably supported on the track for suspending therefrom a plurality of vertically-hanging drapes, fabrics or other products to be displayed said closed loop track having a front section and a rear section joined together by curved end sections; a drive motor; and a pusher member driven by said drive motor along a curved path partly coextensive with one of the curved end sections of the closed loop track between the trailing end of the track front section and the leading end of the track rear section; said pusher member being located to push the flexible closed loop along said one curved end section of the closed loop track to cause it to slide therealong towards the rear section thereof to thereby compact the flexible closed loop track, and the products suspended therefrom, at said rear section of the track for space-saving purposes, and to extend the flexible closed loop, and the products suspended therefrom, at the front section of the track for viewing purposes.

4,192,564

LOAD EQUALIZING SUPPORT SYSTEM

Gerhard K. Losert, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 13, 1978, Ser. No. 959,546

Int. Cl.[2] F16M *11/24;* B60B *33/00*

U.S. Cl. 312—253 **3 Claims**

1. A leveling assembly for supporting an appliance or the like on a surface, said assembly comprising:

A. a bracket secured to and extending across the lower end of one side wall of said appliance, said bracket including;

(1) a lower wall portion having spaced apart openings,

(2) flange portions formed adjacent opposite longitudinal sides of said openings and extending upwardly therefrom;

B. a wheel assembly mounted in said bracket openings being arranged for vertical movement relative to said bracket, said wheel assembly including;

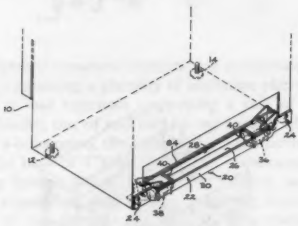
(1) a generally U-shaped housing having a central portion

connecting leg portions extending substantially perpendicular thereto,

(2) means supporting said wheel rotationally between said leg portions,

(3) tab portions extending outwardly from the vertically disposed edge portion of said leg portions dimensioned to provide a guideway for said flange portions to permit movement of said wheel assembly through said opening relative to said flange portions along a vertical axis while maintaining the axis of said wheel parallel with said surface and for preventing movement of said wheel assembly about said vertical axis in a plane defined by the axis of said wheel;

C. a member associated with each of said wheel assembly housings being pivotally mounted in said bracket for maintaining the wheel assemblies in their respective bracket openings including;



(1) a first portion having pivoting means including locating means dimensioned to engage holding means in the lower wall portion of said bracket for allowing pivotal movement of said member relative to said bracket; and

(2) a second portion having a segment in engagement with the central portion of said housing for transmitting a force on said housing substantially perpendicular to the axis of said wheel;

D. connecting means having means at each end portion arranged in said members at a point intermediate said first and second portions for transmitting movement therebetween for causing rotational movement of said members about its pivot in the same direction, whereby when one of the wheel assemblies raises to move one of said members by its movement relative to said surface, the other member moves to cause a lowering of the other wheel assembly relative to said surface with the axis of both of said wheels being parallel to said surface.

4,192,565

MULTI-LEVEL SOCKET FOR AN INTEGRATED CIRCUIT

Richard Gianni, 216 Livorna Heights, Alamo, Calif. 94507

Continuation-in-part of Ser. No. 736,577, Oct. 28, 1976, Pat. No. 4,080,026. This application Nov. 25, 1977, Ser. No. 854,540

Int. Cl.[2] H01R *13/12*

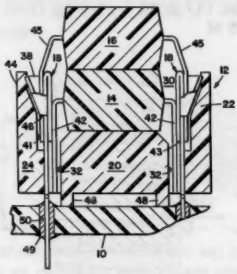
U.S. Cl. 339—17 CF **4 Claims**

1. A multi-level socket for mounting a plurality of integrated electrical circuits, each circuit having a plurality of subtending leads arranged in one or more rows, the socket comprising:

a non-conductive elongated body comprising a base portion, an edge portion unitarily formed with said base portion and upstanding from one side thereof, the body defining a plurality of holes extending through said base portion aligned along the major axis and adjacent the one edge thereof; and

at least two elongated metal contact members each retainably positioned in one of said holes to extend therethrough, each metal contact member having a frictional retention means for retaining one of the subtending leads of a first integrated electrical circuit and one of the subtending leads of a second integrated electrical circuit, each metal contact member further having a contact portion distal of retention means;

each metallic contact member comprising a metal contact pin and wherein said frictional retention means comprises first and second pockets integrally formed with and ex-



tending outwardly of one side of said metal contact pin, one pocket disposed above the other, and said metal contact pin including means for retaining said metal contact pin in one of the plurality of holes extending through the base portion of the non-conductive elongated body.

4,192,566

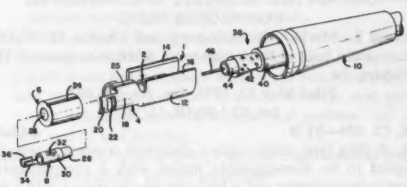
ANTENNA LEAD SPLICE

Ronald C. Laudig, Mechanicsburg, and John A. Morelli, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 26, 1978, Ser. No. 972,758

Int. Cl.[2] H01R *25/00*

U.S. Cl. 339—47 R **5 Claims**



1. A pair of intermatable connector bodies for splicing the ends of electrical coaxial cable, comprising:

an outer one piece metal shell of each connector body having a split barrel portion encircling and radially crimped on a corresponding coaxial cable to be spliced,

each said shell having a closed barrel portion and a dielectric insert received therein,

each said shell including a cavity between said closed barrel portion and a portion of said dielectric insert defining an outer receptacle,

each said insert having a coaxial bore and a metal center contact received in said bore,

each said center contact having an open ended sleeve section and a split barrel section projecting outwardly of a corresponding said insert,

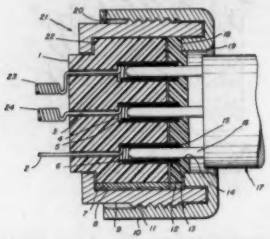
said conductor projecting within and along said sleeve section and being secured in said split barrel section,

said sleeve section being larger in diameter than said corresponding conductor to define an inner receptacle matingly receiving the split barrel section of the other connector body, and

each said shell having an elongated tongue portion projecting outwardly beyond said split barrel portion and mata-

bly received in said outer receptacle of the other connector body.

4,192,567
ELECTRICAL CONNECTOR
William Gomolka, 1 Patriots Dr., Canton, Mass. 02021
Filed May 8, 1978, Ser. No. 903,410
Int. Cl.[2] H01R *7/28, 9/12, 13/62*
U.S. Cl. 339—75 M **23 Claims**



1. An electrical connector comprising a female part including a housing having at least one bore therein, receptacle means comprising a coiled spring disposed in the bore of the housing and for receiving a male part having an outer dimension comparable to the inner dimension of the coiled spring, and means for engaging the spring to change the state thereof so that the inner diameter of the receptacle changes from one diameter to a lesser, locked-position diameter including a restraining means at one end of the housing facing the open bore and means for urging the restraining means against the spring to axially compress the spring to thereby increase its diameter so as to easily accommodate the male part.

4,192,568
CONNECTOR ASSEMBLY AND IMPROVED CONNECTOR PLUG
Richard L. Marks, Mechanicsburg, and Charles H. Weidler, Lancaster, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 12, 1978, Ser. No. 905,503
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—91 R **4 Claims**

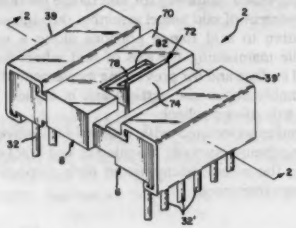
1. A plug type multi-contact electrical connector which is adapted to be disengageably mated with a complementary receptacle connector and which can also be mated with a post header on a circuit board, said plug connector comprising:

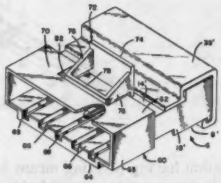
an insulating housing having a mating face and a wire-receiving face, sidewalls and endwalls extending between said mating face and said wire-receiving face, a plurality of terminal-receiving cavities extending through said housing and between said faces, said cavities being in a single row which extends between said endwalls,

a pair of spaced-apart latch ears centrally located between said endwalls on one of said sidewalls, each of said latch ears each having a ramp portion which extends obliquely beginning at said mating face away from said one sidewall and towards said wire-receiving face, each of said latch ears further having a latching shoulder spaced from said mating face and directed towards said wire-receiving face,

a pair of spaced-apart camming ramp members extending from said one sidewall, said latch ears being between said camming ramp members, each of camming ramp members comprising a first ramp which begins at said mating face and extends obliquely away from said one sidewall and towards said wire-receiving face, said first ramp merging at a ridge with a second ramp which extends obliquely towards, and merges with, said one sidewall and extends towards said wire-receiving face, said ridges of said camming ramp members having an elevation above said one sidewall which is at least equal to the elevation of said shoulders above said one sidewall whereby,

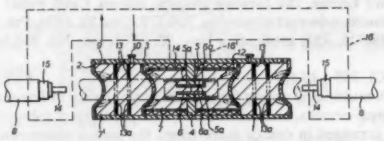
said connector can be mated with a receptacle connector having positive latch means which are engageable with said shoulders to latch said receptacle connector to said plug con-





nector, and said plug connector can aso be mated with a pin header having a latch arm extending therefrom, said camming ramp members being engageable with said latch arm to flex said latch arm away from said locking ears when said plug connector is mated with, and unmated from said pin header.

4,192,569
UNDERWATER CONNECTOR
Peter E. R. Mucci, Gravesend, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Dec. 7, 1978, Ser. No. 967,253
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—96 **8 Claims**

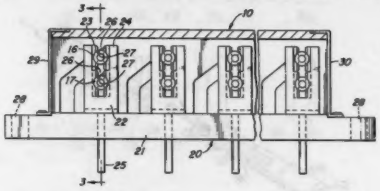


1. A connector comprising an outer casing, first wall members defining a first chamber in the casing, at least one connection terminal within the first chamber, a first diaphragm closing the first chamber, second wall members defining a second chamber behind the first diaphragm a second diaphragm closing the second chamber, each diaphragm having an aperture openable by a plug plugged into the connector terminal and penetrating both diaphragms, both chambers being adapted to be filled with an electrically insulating grease, jelly or similarly viscous liquid.

4,192,570
INSULATED ELECTRICAL CONDUCTOR TERMINATION CONSTRUCTION

Robert H. Van Horn, Worthington, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1978, Ser. No. 935,475
Int. Cl.[2] H01R 9/08
U.S. Cl. 339—98 5 Claims

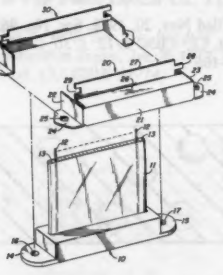


1. An electrical connector construction comprising terminal block means mounting a plurality of insulation piercing terminals, each of said terminals comprising a pair of opposing bifurcated blades, one of said pair having cutting edges at the opening of a bifurcation, the other of said pairs having cutting edges at the base of a bifurcation, and a substantially "U" shaped clip having a pair of opposing flanges, said flanges having corresponding pairs of slots extending inwardly from the edges of said flanges, said pairs of slots terminating in corresponding pairs of conductor seatings aligned perpendicularly from said flange edges and in registration with said blade bifurcations, said clip being moveable into engagement with said terminal block means for simultaneously inserting conductor pairs when loaded in said conductor seatings across said flanges through said slots in said blade bifurcations of corresponding ones of said terminals.

4,192,571
ELECTRICAL CONNECTOR STRAIN RELIEF HOUSING

Michael G. Strautz, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 949,448
Int. Cl.[2] H01R 13/58
U.S. Cl. 339—103 M 6 Claims

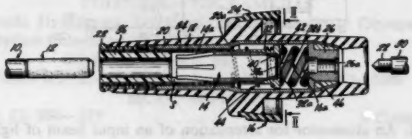


1. Strain relief apparatus for a flat ribbon cable (11) terminating in an electrical connector (10) characterized in a housing (20, 30) for partially enclosing said connector (10), said housing (20, 30) having a pair of flanges (27) extending outwardly from said connector (10) for clasping opposite sides of said cable (11), further characterized in an outwardly extending lug (28) on one end of one flange (27) and a notch (29) on the corresponding end of the other flange (27), said lug (28) being adapted to fold into said notch (29) thereby piercing a margin (13) of said cable (11).

4,192,572
ELECTRICAL CONNECTOR APPARATUS

Robert J. Stanger, Alpha, and Larry N. Siebens, Great Meadows, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 856,903, Dec. 2, 1977, abandoned, which is a continuation of Ser. No. 406,281, Oct. 15, 1973, abandoned. This application Nov. 13, 1978, Ser. No. 960,021
Int. Cl.[2] H01R 13/52
U.S. Cl. 339—111 51 Claims



1. A separable female connector for use in connecting or disconnecting an energized high voltage circuit by engagement or disengagement with a complementary connector having a male contact element, said female connector comprising:

a housing, said housing having first and second ends and an axially extending opening therebetween,

a female contact assembly in said housing opening, said assembly including

(a) a tubular sleeve having piston means at one end thereof for defining a first chamber within said tubular sleeve,

(b) female contact means fixedly positioned with respect to said tubular sleeve in said first chamber for engaging said male contact element, said female contact means being electrically connected to said piston means,

(c) guide means at the other end of said tubular sleeve for receiving and guiding said male contact element for movement within said first chamber, and for evolving arc-quenching gas in response to an arc being struck between said male contact element and said female contact means during said movement,

said tubular sleeve being mounted in said housing opening for axial movement between a first position wherein said piston means is substantially adjacent to said second end of said housing and a second position wherein said piston means is located between its said first position and said first end of said housing,

said housing opening defining a second chamber, said female contact assembly further including

(d) valve means responsive to arc-quenching gas of predetermined pressure in said first chamber to provide a passage from said first chamber to said second chamber for applying said gas to said piston means thereby displacing said tubular sleeve from said first position to said second position and accelerating engagement of said female contact means with said male contact element to extinguish said arc,

biasing means between said housing and said tubular sleeve for normally maintaining said tubular sleeve in said first position, for permitting joint movement of said male contact element and said tubular sleeve between said first position and said second position during withdrawal of said male contact element from said connector, and for accelerating the return of said tubular sleeve to said first position upon disengagement of said male contact element from said female contact means,

terminal means in said second end of said housing adapted for connection in a high voltage circuit, and

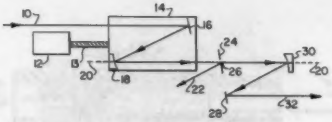
conductor means disposed interiorly of said second chamber between said second end of said housing and said piston means for electrically connecting said piston means and said terminal means.

4,192,573

VARIABLE POWER ATTENUATOR FOR LIGHT BEAMS

Ray B. Brown, Jr., Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 768,657, Feb. 14, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,105
Int. Cl.[2] G02B *17/06*
U.S. Cl. 350—55 8 Claims



1. An attenuator for attenuation of an input beam of light comprising:

a first flat mirror for reflecting the input beam of light;

a first focusing mirror for receiving the beam of light reflected from said first flat mirror, said first focusing mirror being fixed relative to said first flat mirror so that the axis of the beam of light reflected by the first focusing mirror is offset from and parallel to the axis of the input beam of light;

a pinhole assembly for receiving the beam of light reflected from said first focusing mirror, said pinhole assembly including a pinhole positioned on the axis of the beam of light reflected by said first focusing mirror; and

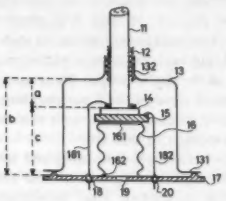
means for moving said first flat mirror and said first focusing mirror in unison relative to said pinhole assembly in a direction parallel to the axis of the input beam of light, said parallel movement of said mirrors acting to vary the proportion of the input beam of light that passes through said pinhole.

4,192,574

SEALED ENCLOSING SYSTEM FOR COUPLING AN OPTOELECTRONIC DEVICE AND AN OPTICAL FIBRE

Raymond Henry; Jean-Claude Resneau, and Jean-Victor Bouvet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 10, 1978, Ser. No. 895,224
Claims priority, application France, Apr. 13, 1977, 77 11061
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.17 5 Claims



1. A sealed system for coupling an optoelectronic device and an optical fiber, comprising:

a first enclosure consisting of a metal cap having, at its top, a sealed passageway for an optical fibre, said cap being welded onto a base;

a second enclosure, located in said first enclosure, consisting of a length of bellows tube closed by a metallic plate at one end and welded to said base at the other end, said base being common to both of said enclosures;

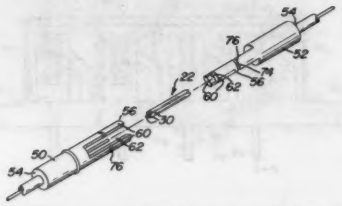
a platform adapted to support said optoelectronic device and being integral with said metallic plate.

4,192,575

GUIDE-CONNECTOR ASSEMBLY FOR JOINING OPTICAL FIBERS AND METHOD OF MAKING GUIDE THEREFOR

Malcolm H. Hodge, Philadelphia, Pa., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 758,106, Jan. 10, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 968,044
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 50 Claims



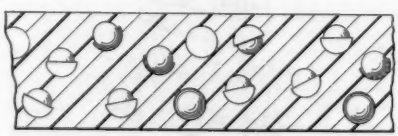
33. A connector for making an optic signal transmissive connection between the ends of a pair of optic fibers, said connector comprising first and second mateable connecting portions and a guide member comprising at least three predetermined length glass members having cylindrical surface portions disposed in a side-by-side array parallel to one another, with the longitudinal peripheral portions of adjacent members fused together to form an integral unit having a cusp-shaped interstitial channel whose surfaces are smooth, whereby said surfaces guide the ends of a pair of optic fibers inserted into said channel into immediate proximity with each other to form a good optical signal transmissive joint.

4,192,576

ULTRA-HIGH-INDEX GLASS MICROSPHERES AND PRODUCTS MADE THEREFROM

Chi F. Tung, Mahtomedi, Minn., and James A. Laird, Saint Joseph Township, Saint Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 20, 1978, Ser. No. 962,324
Int. Cl.[2] C03C *3/12, 3/30;* G02B *5/128*
U.S. Cl. 350—105 14 Claims



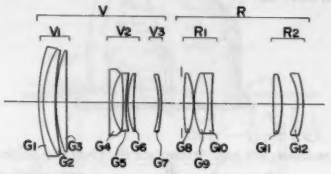
1. Transparent glass microspheres having an index of refraction of 2.7 or higher comprising 65–85 weight-percent Bi_2O_3 and 5–35 weight-percent TiO_2, with any added ingredients totaling up to about one-fourth of the composition by weight; said microspheres having been heat-treated, as indicated by the absence from their temperature profile during differential thermal analysis of an exothermic peak in the temperature interval of about 500° to 650° C.

12. Transparent film in which hemispherically reflectorized microspheres of claims 1, 2, or 5 are fully embedded.

4,192,577
ZOOM LENS SYSTEM

Shuji Ogino, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1978, Ser. No. 873,796
Claims priority, application Japan, Feb. 4, 1977, 52-12007
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—184 14 Claims

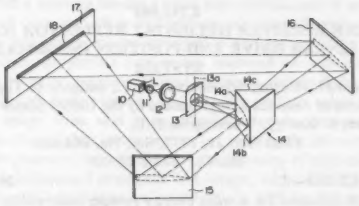


1. A zoom lens system comprising:
a front lens group of a positive refractive power consisting of a positive single lens component and a positive doublet component formed by cementing negative and positive single lenses;
a variator lens group of a negative refractive power consisting of a first negative single lens component, a second negative single lens component at the image side of the first negative single lens component and a positive single lens component at the image side of the second negative single lens component, the second negative single lens component and the positive single lens component forming a negative meniscus shaped air space therebetween;
a compensator lens group of a negative refractive power consisting of one lens component; and
a relay lens group having a first sub-group and a second sub-group at the image side of the first sub-group, the first sub-group following the compensator lens group without any lens element interposed and consisting of a positive single lens component and a positive doublet component, while the rear sub-group consisting of a positive lens component and a negative single lens component at the image side of the positive lens component.

4,192,578
METHOD OF PROJECTING A LINE IMAGE OF UNIFORM BRIGHTNESS

Masane Suzuki, Omiya, and Kenzi Yasuda, Kitamoto, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Jul. 5, 1978, Ser. No. 921,974
Claims priority, application Japan, Jul. 8, 1977, 52-81751
Int. Cl.[2] G02B *27/14*
U.S. Cl. 350—320 4 Claims

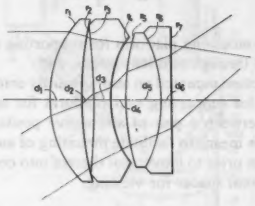


1. A method of projecting a line image of uniform brightness onto a surface, comprising
causing a laser beam to be emitted from a laser,
diverging the emitted laser beam into a flat beam, the flat beam being symmetrical about its optical axis with respect to distribution of intensity,
dividing the flat beam into two portions along a line passing normal thereto through its optical axis, said two portions being symmetrical to each other with respect to intensity distribution, and
utilizing mirrors to reflect and project the two portions onto the surface to be superimposed with each other so that the maximum intensity area of one portion falls on the minimum area of the other portion, thereby forming a line image of uniform brightness on the surface.

4,192,579
BEHIND-STOP TYPE LENS SYSTEM FOR PHOTOGRAPHIC CAMERAS

Kazushi Hyakumura, Hachiouji, Japan, assignor to Olympus Optical Company Limited, Toyoto, Japan

Filed Jan. 30, 1978, Ser. No. 873,499
Claims priority, application Japan, Feb. 8, 1977, 52-12693
Int. Cl.[2] G02B *9/20*
U.S. Cl. 350—227 8 Claims



1. A behind-stop type lens system for photographic cameras comprising a first positive meniscus lens component having a convex surface on the object side, a second biconcave lens component and a third cemented doublet component consisting of a biconvex lens element and a negative lens element, and said lens system satisfying the conditions enumerated hereunder:
(1) $0.23f < \Sigma d < 0.28f$
(2) $0.55 < f_1 < 0.59f$.
(3) $-0.37f < f_2 < -0.32f$
(4) $n_1 > 1.71$
(5) $n_2 < 1.67$
(6) $|r_7| > 4.8f$
(7) $0.26f < -r_6 < 0.34f$
(8) $|r_3|/r_4 > 6.0$
(9) $\nu_1 - \nu_2 > 14$
wherein the reference symbol Σd represents total length of said lens system as a whole, the reference symbols f_1, f_2 and f designate focal lengths of the first, second lens components and the lens system as a whole respectively, the reference symbols n_1 and n_2 denote refractive indices of the first and second lens components respectively, the reference symbols r_3 and r_4 represent radii of curvature on the respective surfaces of the second lens component, the reference symbols r_6 and r_7 designate radii of curvature on the cemented surface and image side surface respectively of the third lens component and the reference symbols ν_1 and ν_2 denote Abbe's numbers of the first and second lens components respectively.

4,192,580
TOY MICROSCOPE

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,197
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—238 3 Claims

1. A toy microscope, comprising:
a base portion;
a body extending upwardly from said base portion;

a hollow head portion mounted at the upper end of said body in a stationary position, at an angle with respect to said base;

lens means mounted in said hollow head portion for magnifying an object;

a transparent closed end cup-shaped spacer mounted on the lower end of said lens means for maintaining a predetermined spacing between said lens means and said object;

an object mounting platform for supporting an object to be viewed through said lens means; and

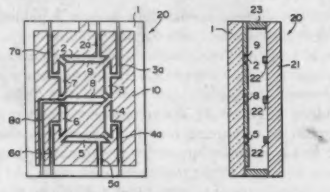
a leg structure mounted on said upwardly extending body by means for supporting said platform for selective movement between a pair of alternative positions relative to said lens means to facilitate mounting of an object on said platform prior to movement thereof into contact with said transparent spacer for viewing.

4,192,581

ELECTROCHROMIC DISPLAY DEVICE

Masachika Yaguchi, Yokohama, and Haruhiro Kato, Kawasaki, both of Japan, assignors to Dai Nippon Toryo Co, Ltd., Osaka, Japan

Filed Feb. 17, 1977, Ser. No. 769,564
Claims priority, application Japan, Feb. 20, 1976, 51-17509
Int. Cl.[2] G02F *1/17, 1/23*
U.S. Cl. 350—357 **24 Claims**



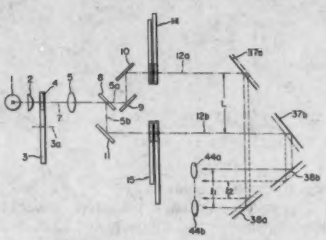
1. An electrochromic display device comprising a pair of oppositely disposed electrode plates each bearing on the inner surface thereof an electrode and an electrochromic composition sealed between said pair of oppositely disposed electrode plates, said electrochromic composition consisting essentially of an electrochromic compound which is colored in and present in its reduced state and a solvent selected from the group consisting of (a) water and (b) water and alcohol, the solubility of said electrochromic compound to said solvent being not less than 10^{-2} mol/(100 g solvent) in said reduced state and not less than 10^{-1} mol/(100 g solvent) in an oxidized state, said electrochromic composition being sealed between said pair of electrode plates in said reduced state.

4,192,582

OPHTHALMOMETER

Mitsugu Aoki; Yoshikazu Konishi, and Taketoshi Ishihara, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,439
Claims priority, application Japan, Apr. 20, 1977, 52-45554
Int. Cl.[2] A61B *3/02*
U.S. Cl. 351—30 **4 Claims**



1. Ophthalmometer comprising chart projecting optical means having a projecting optical path, ophthalmoscopic inspection chart means having a plurality of inspection charts each including a Landolt ring with a slit, chart advancing means for driving said chart means so that said charts are located in the projecting optical path in sequence one after another whereby an image of the chart in the projecting optical path is produced on a projecting plane, corrective lens means having a plurality of corrective lenses of different dioptral values, lens driving means for driving said corrective lens means so that the corrective lenses are brought into an operative position in sequence one after another, means for providing a mark around the chart image on the projecting plane, means for moving the mark circumferentially around the chart image, manual switch means adapted to be actuated by a patient, discriminating circuit means for discriminating whether the switch means has been actuated when the mark is in a position corresponding to the slit of the projected chart, means connected with the discriminating circuit means for energizing the chart advancing means so that an advanced chart is projected when the switch means is actuated while the mark is in a position corresponding to the slit of the projected chart and for energizing the lens driving means so that a lens having a larger dioptral value is placed in the operative position when the switch means is actuated while the mark is in a position other than the position corresponding to the slit of the projected chart.

4,192,583

SOLAR RECEIVER HELIOSTAT REFLECTOR HAVING A LINEAR DRIVE AND POSITION INFORMATION SYSTEM

Richard H. Horton, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 21, 1977, Ser. No. 844,403
Int. Cl.[2] G03B *21/00*
U.S. Cl. 353—3 **24 Claims**

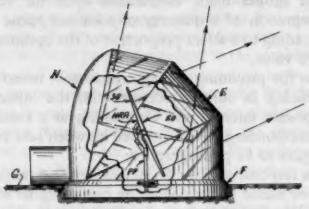
1. A heliostat for a solar energy system comprising:

A. a reflector;

B. means for supporting said reflector for bi-axial movement about a horizontal axis and a vertical axis whereby said reflector is capable of movement about said axes to have its elevation angle and azimuth angle changed,

C. drive means for operating said supporting means for moving said reflector to adjust the angular disposition of said reflector in both elevation and azimuth comprising

increment movement motor means, said motor means comprising a linear drive tape, and



D. a position control tape for controlling the position of said linear drive tape.

4,192,584

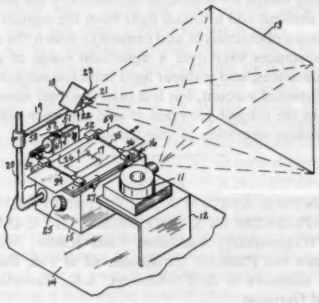
SYSTEM FOR CREATING MOTION EFFECTS EMPLOYING STILL PROJECTION EQUIPMENT

Walter S. Dougherty, Stone Mountain, Ga., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Aug. 15, 1978, Ser. No. 933,746

Int. Cl.² G03B *21/26, 21/14*

U.S. Cl. 353—30 **19 Claims**



1. Projection apparatus for producing visual motion effects, the apparatus comprising a viewing surface, a first projection means to project a still first image onto said viewing surface, a second projection means to project a moving second image onto said viewing surface superimposed on said first image, said second projection means comprising a light source provided with a housing having a clear top portion, carrier means supported over said clear top portion, an image-forming element on said carrier means arranged to be illuminated by said light source, projection lens means focussed on said image-forming element, means arranged to direct output light rays from said lens means toward said viewing surface, whereby a second image from said image-forming element is superimposed on the still first image, means for varying the intensity of said light source to selectively vary the intensity of said second image superimposed over said first image, said carrier means being capable of orientation selectively in different directions around the optical axis of said lens means, said carrier means being rotatably movable about an axis substantially perpendicular to its plane of rectilinear movement for varying its direction of movement, transport means to move said carrier means rectilinearly over said light source to cause the superimposed second image to move rectilinearly over the still first image on said viewing surface in a direction in accordance with the orientation of said carrier means, and means to vary the speed of rectilinear movement of the carrier means over the light source.

4,192,585

SLIDE PROJECTOR WITH AUTOMATIC FOCUSING SYSTEM

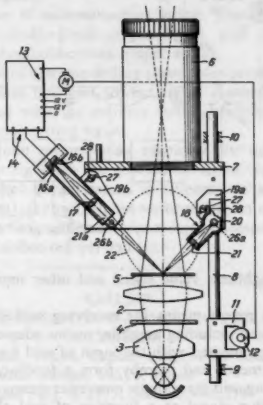
Kurt Henkelmann, Wissmar, and Dietrich Brückner, Nauborn, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,499

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713186

Int. Cl.² G03B *3/10*

U.S. Cl. 353—101 **4 Claims**



1. In a slide projector having an automatic focusing system comprising a scanning auxiliary projecting system equipped with a light source projecting a light beam and position control for focusing a slide, a main projection beam passing through said slide along an optical axis, a scattered light zone generated by said slide when said main projection beam passes through said slide, and a light sensor with a lens in front thereof detecting light reflected from said slide after being projected thereon by said scanning auxiliary projecting system, the improvement comprising:

(a) said lens (17) in front of said light sensor (15) of said scanning auxiliary projecting system arranged with an entry aperture (21*a*) outside said scattered light zone (22) for increasing the difference in the intensities between the measuring light and light scattered from said main projection beam;

(b) said light source (20) of said scanning auxiliary projecting system (18) operated below the rated voltage thus increasing the portion of infrared light within said light beam without using respective filter means; and

(c) silicon cells protectively covered with a layer of crystal-clear resin used in said light sensor.

4,192,586

ELECTRONIC SYSTEM FOR PHOTOGRAPHIC DEVICES

Jean Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Jul. 21, 1975, Ser. No. 597,479

Int. Cl.² G03B *17/20*

U.S. Cl. 354—24 **33 Claims**

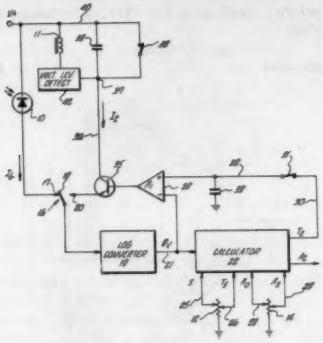
1. In a photographic device having a lens through which light passes for exposing film, and having shutter means interposed between said lens and film for controlling the time of

exposure, an electronic system for controlling the shutter means comprising

light sensor means for receiving light and providing an electrical output signal as a function of the received light,

logarithmic converter means having an input for receiving said electrical output signal and providing an output log signal proportional to brightness value,

control circuit means coupled with said logarithmic converter means for receiving said brightness value signal and providing a shutter control signal which is a function of



the brightness value signal and other input parameters, and

feedback circuit means for receiving said shutter control signal and including amplifier means adapted to be selectively connected with the input of said logarithmic converter means and thereby form a feedback circuit loop including said logarithmic converter means for generating an antilog signal as a function of said shutter control signal, said antilog signal being adapted to control said shutter means.

4,192,587

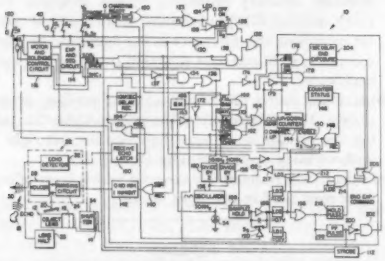
PROPORTIONAL FILL FLASH

Arthur G. LaRocque, Belmont; George D. Whiteside, Lexington, and Bruce K. Johnson, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 13, 1978, Ser. No. 960,062

Int. Cl.[2] G03B 7/08, 15/03

U.S. Cl. 354—27 **37 Claims**



1. A camera including a system for controlling the energization of a source of artificial illumination during a photographic exposure interval occurring under conditions of substantial ambient scene light intensity, said camera comprising:

means for defining a film exposure plane;

means for automatically controlling a photographic exposure interval, said control means comprising a shutter blade mechanism operable to provide progressively increasing aperture values during an exposure interval and means for detecting and integrating scene light in correspondence with the scene light admitted by said blade mechanism to said film exposure plane during the photographic exposure interval and for automatically closing said shutter blade mechanism upon the detection and integration of a quantity of admitted scene light corresponding to a select proportion of the optimum film exposure value;

means for providing a range responsive timed signal commencing in correspondence with the initiation of said exposure interval and terminating at a subsequent time corresponding to the distance between said camera and a subject to be photographed;

means responsive to the termination of said range responsive timed signal for providing an output signal to initiate the energization of the source of artificial illumination; and

means responsive to said output signal of said last stated means for controlling said scene light detecting and integrating means to discount the artificial illumination provided by the source of artificial illumination such that said select proportion of the optimum film exposure value is directly attributable to ambient scene light while the remaining proportion of the optimum film exposure value is directly attributable to artificial scene light provided by the source of artificial illumination.

23. In a camera adapted to be energized at least in part by a source of electrical energy and including means for defining a film plane and means for mounting a source of artificial illumination adapted to be fired from the source of electrical energy under conditions of substantial ambient light, the improvement comprising means for providing substantially the same proportions of ambient and artificial light from the subject for different exposure operations of said camera in which the camera-to-subject distances vary over a significant range of camera-to-subject distances, said ambient light from the subject constituting a substantial amount, but less than the total amount, of the light from the subject provided at said exposure plane in each such exposure operation of said camera.

4,192,588

CONTROL SYSTEM FOR CONTROLLING THE DIAPHRAGM IN A PHOTOGRAPHIC CAMERA

Eduard Wagensonner, Aschheim; Alois Rieder, Munich, and Bernhard von Fischern, Ottobrunn, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

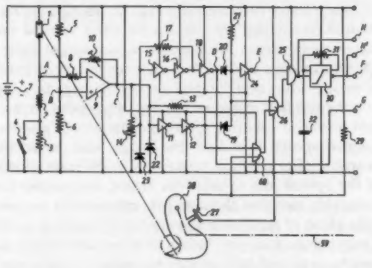
Continuation of Ser. No. 629,546, Nov. 6, 1975, Pat. No. 4,079,391. This application Sep. 20, 1977, Ser. No. 835,854

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1974, 2453285

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—43 **3 Claims**



1. In an exposure-light-intensity control system, in combination,

an adjustable diaphragm;

a stepper motor having an output coupled to the diaphragm for adjusting the diaphragm setting, the stepper motor having a plurality of successively energizable windings, the stepper motor being capable of changing the diaphragm setting within arrange of settings bounded by a first extreme setting and a second extreme setting;

motor-control circuit means connected to the stepper motor windings, and having an enablement-signal input for receipt of an enablement signal commanding that the stepper motor operate, and having a direction-signal input for receipt of a direction signal indicating the direction in which the stepper motor is to operate, the motor-control circuit means being operative for preventing stepper motor operation in the absence of an enablement signal irrespective of the presence of a direction signal, and being operative in the presence of an enablement signal for causing the stepper motor to operate in the direction indicated by the direction signal;

photosensitive means operative for generating an actual-value signal corresponding to the intensity of light actually passing through the diaphragm;

reference means operative for generating a desired-value signal indicating a reference value for the intensity of light passing through the diaphragm;

differential amplifier means having inputs connected to receive the actual-value and desired-value signals and having an output, and operative for producing at its output an error signal indicating the sense and the amount of the discrepancy between the actual-value and desired-value signals, the error signal having a predetermined intermediate value when the discrepancy between the actual-value and desired-value signals is zero;

first and second bistable threshold circuits, each having an input and an output, the inputs of the threshold circuits being connected to receive the error signal, the first threshold circuit producing an output signal when the error-signal amplitude exceeds a predetermined first threshold value lower than said intermediate value, the second threshold circuit producing an output signal when the error-signal amplitude exceeds a predetermined second threshold value higher than said intermediate value, said first and second threshold values together defining a tolerance range containing said intermediate value,

the concurrent absence of both a first threshold-circuit output signal and a second threshold-circuit output signal constituting a first signal combination,

the concurrent presence of both a first threshold-circuit output signal and a second threshold-circuit output signal constituting a second signal combination;

extreme-setting detector switch means operative for generating an extreme-setting signal indicating that the diaphragm has been brought to an extreme setting;

evaluating circuit means operative for causing the stepper motor to change the diaphragm setting in the direction towards said first extreme setting in response to said first signal combination and in the direction towards said second extreme setting in response to said second signal combination, said first extreme setting being associated with said first signal combination, said second extreme setting being associated with said second signal combination,

said evaluating circuit comprising

direction-signal furnishing means having an input connected to the output of at least one of the two threshold circuits and having an output connected to the direction-signal input of the motor-control circuit, and

logic circuit means comprising a plurality of interconnected logic gates, the logic circuit means having an output connected to the enablement-signal input of the motor-control circuit means and operative for alternatively applying or not applying an enablement signal to the enablement-signal input, the logic circuit means having inputs connected to the first threshold circuit, the second threshold circuit and the extreme-setting detector switch means,

the logic circuit means being operative for distinguishing among the following distinct situations:

(a) absence of extreme-setting signal, plus absence of first threshold-circuit output signal, plus absence of second threshold-circuit output signal,

(b) absence of extreme-setting signal, plus presence of first threshold-circuit output signal, plus absence of second threshold-circuit output signal,

(c) absence of extreme-setting signal, plus presence of first threshold-circuit output signal, plus presence of second threshold-circuit output signal,

(d) presence of extreme-setting signal, plus presence of the one said first and second signal combinations associated with the extreme setting corresponding to the extreme-setting signal,

(e) presence of extreme-setting signal, plus presence of first threshold-circuit output signal, plus absence of second threshold-circuit output signal,

(f) presence of extreme-setting signal, plus presence of the one of said first and second signal combinations not associated with the extreme setting corresponding to the extreme setting signal,

the logic circuit means being operative for applying an enablement signal to the enablement-signal input of the motor-control circuit means in response to any one of situations (a), (c) and (f), but withholding an enablement signal from the enablement-signal input in response to any one of situations (b), (d) and (e).

4,192,589

ABNORMAL OPERATION WARNING APPARATUS FOR A CAMERA

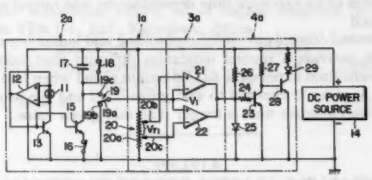
Seijiro Tokutomi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,579

Claims priority, application Japan, Nov. 8, 1976, 51/149732[U]

Int. Cl.[2] G03B *17/20*

U.S. Cl. 354—53 **3 Claims**



1. An abnormal operation warning apparatus for a camera, comprising:

first voltage signal generating means for producing a first voltage signal having a level proportional to the sensitivity of the film used;

a second voltage signal generating means for producing a second voltage signal having a level proportional to the amount of light exposed onto an exposure surface portion of said film, said second voltage signal generating means comprising a light measuring circuit including a light receiving element for receiving light reflected from the exposure surface portion of the film;

a comparison means coupled with said first and second voltage signal generating means for comparing the level of said first voltage signal derived from the former with that of said second voltage signal derived from the latter; and

a discriminating means coupled with said comparison means for detecting the difference between the levels of said first and second voltage signals compared thereby and for generating an output which permits the photographer to

identify each photographic result in response to the magnitude of said difference.

4,192,590

INDICATING SYSTEM FOR CAMERAS

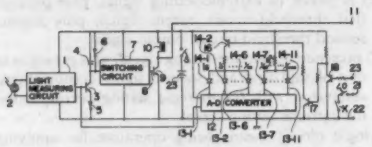
Mashio Kitaura, Tondabayashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1978, Ser. No. 941,730

Claims priority, application Japan, Sep. 13, 1977, 52-124035[U]

Int. Cl.[2] G03B *17/20, 7/16*

U.S. Cl. 354—53 **9 Claims**



1. A photographic condition indicating system for a camera with an electronic flash device including an electronic flash tube, a main capacitor for energizing the flash tube and a circuit for charging the main capacitor at least to a given level, and which permits flash firing when the prospective effective exposure time is longer than a given value, said indicating system comprising:

a light measuring circuit for generating an output signal as a function of the brightness of an object to be photographed;

an indicating means;

a first control circuit responsive to said output signal for controlling said indicating means to provide a first indication of an exposure time dependent on said output signal; and

a second control circuit for controlling said indicating means to provide a second indication different than said first indication in response to said output signal when said main capacitor is charged to said given level and the prospective exposure time is longer than said given value.

4,192,591

ROTATABLE ADAPTER FOR USE IN OPTICALLY COUPLING A VIEWING DEVICE WITH A PHOTOGRAPHIC CAMERA

Edward A. Yobaccio, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 27, 1978, Ser. No. 955,338

Int. Cl.[2] G03B *29/00*

U.S. Cl. 354—62 **3 Claims**

1. An adapter for optically and mechanically coupling a photographic camera to the proximal end of an optical viewing device such as an endoscope so that the image of an object formed by the optical viewing device can be simultaneously viewed and photographed, the camera being of the type which has a through-the-lens viewing system and the optical viewing device being of the type which has an eyepiece located at its proximal end for forming a viewable image of the object, said adapter comprising:

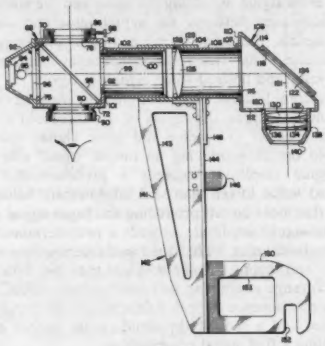
a first housing section for forming a releasable generally light-tight mechanical connection with the proximal end of the optical viewing device;

optical means disposed within said first housing section for establishing a folded light path having one axis, aligned with the optical axis of the viewing device's eyepiece, along which the viewable image formed by the viewing device can be directly viewed and another axis, disposed at a predetermined angle with respect to said one axis, along which light rays which form said viewing device's viewable image are directed by said optical means;

a second generally light-tight housing section structured for rotatably coupling with said first housing section and having apertured entrance and exit ends of which said entrance end is aligned with said other axis of said first housing section's folded light path so that the light rays which form the viewing device's viewable image and are directed along said other axis of said first housing section's folded light path by said optical means enter said second housing section through said second housing section's entrance aperture;

rotationally symmetric optical means fixedly mounted in said second housing section for establishing a folded light path between said second housing section's entrance and exit apertures, for intercepting the image forming light rays which are directed along said other axis of said first housing section's folded light path to form at a predetermined spatial location within said second housing an aerial image of the object viewed via the optical viewing device and for facilitating focusing of the camera's objective lens on said aerial image through said second housing section's exit aperture; and

means for releasably attaching the camera to said second



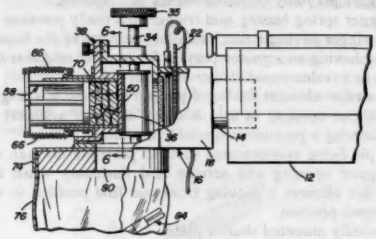
housing section so that the camera's objective lens is aligned in a predetermined manner with said exit aperture of said second housing section whereby the viewing device's viewable image can be viewed through said exit aperture via the camera's viewing system for purposes of focusing the camera thereon and afterwards for photographing said aerial image,

said adapter thus being structured to permit the viewable image of the object formed by the optical viewing device to be directly viewed along said one axis of said first housing section's folded light path, to be viewed through the camera's viewing system along said second housing section's folded light path for purposes of focusing or alternate viewing, to be photographed along said second housing section's folded light path, and also structured for rotating said second housing section, including the camera, with respect to said first housing section so that the camera can be moved to a plurality of angular positions with respect to said first housing section from any of which positions the viewing device's viewable image of the object can be photographed after the camera has been focused, the availability of said plurality of camera positions thus providing the photographer with the option of placing the camera in a comfortable position for his purposes without introducing any reversals in the image as observed directly along said one axis of said first housing section's folded light path.

4,192,592
CHEMICALLY DEHYDRATED COLD CAMERA

Robert H. Thayer, 1501 Ariz. St., El Paso, Tex. 79902

Filed Jun. 16, 1978, Ser. No. 917,024
Int. Cl.[2] G03B *29/00*
U.S. Cl. 354—76 9 Claims

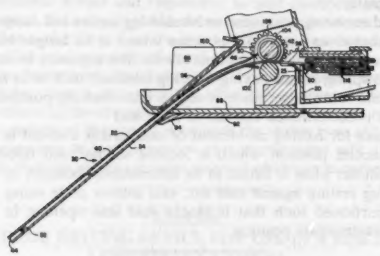


1. In a multiple exposure camera having a sealed housing enclosing an airtight film chamber through which photographic film is displaced from a storage roll and positioned for prolonged exposure through an exposure window and a contractible refrigerating chamber within which dry ice is stored for maintaining the film at a temperature inhibiting latent image decay, means for preventing precipitation of ice on the film, comprising an auxiliary enclosure attached to the housing having an access opening in communication with said film chamber, chemical dehydrating means carried in said enclosure for removing moisture from said film chamber, and means for externally heating said exposure window of the film chamber to prevent condensation of moisture thereon.

4,192,593
PHOTOGRAPHIC FILM ASSEMBLAGE

Philip R. Norris, Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1978, Ser. No. 947,425
Int. Cl.[2] G03B *17/50, 17/26*
U.S. Cl. 354—86 7 Claims



1. A film assemblage for use with a camera of the self-developing type having a pair of superposed rollers mounted in position to receive therebetween an exposed film unit as it exits from a cassette for rupturing a container of processing liquid attached to the exposed film unit to thereby spread its contents across a photosensitive layer thereof to initiate formation of a visible image therein while simultaneously advancing the exposed film unit toward the exterior of the camera, said film assemblage comprising:

a film cassette having an exposure opening in one wall thereof, through which a film unit is adapted to be exposed, an ingress opening through which a portion of a film advancing member is adapted to extend prior to moving an exposed film unit out of said film cassette, and an egress opening through which the exposed film unit is adapted to be moved from said film cassette by the film advancing member;

a plurality of film units located within said film cassette, each said film unit comprising a photosensitive layer and a container of processing liquid, said film units being arranged in a stack with said photosensitive layer of an endmost film unit being located adjacent to and in alignment with said exposure opening;

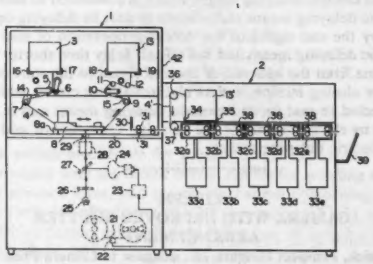
an imbibition chamber formed from an opaque material ahd having first and second oppositely located open ends, said imbibition chamber being located within said film cassette between said endmost film unit and said exposure opening so as to prevent premature exposure of said endmost film unit and with said first open end located adjacent said ingress opening and said second open end located in alignment with said egress opening, said first and second open ends having a width larger than that of said film units; and

means for tethering said imbibition chamber to said film cassette such that when said film assemblage is properly located within the camera and said imbibition chamber is moved out of said film cassette via said egress opening by the film advancing member and the rollers, said tethering means terminates movement of said imbibition chamber when said first open end of said imbibition chamber first moves out of engagement with said rollers and a portion of said imbibition chamber including said second open end is located exteriorly of the camera, whereby said imbibition chamber is maintained in position to receive said endmost film unit, subsequent to its exposure, via said first opening as it exits from the rollers and maintain at least the portion of its said photosensitive layer which is located within said portion of said imbibition chamber which is located exteriorly of the camera in a substantially light free environment until said exposed endmost film unit is removed from said imbibition chamber via said second opening.

4,192,594
CAMERA FILM PROCESSOR

Toshiaki Oidaira; Katsumi Asanuma; Takekazu Yanagimoto; Senzi Yasui, all of Tokyo; Kozo Saito, Higashikurume, and Yoshio Hakamata, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 20, 1978, Ser. No. 953,175
Claims priority, application Japan, Oct. 21, 1977, 126466
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—90 3 Claims



1. A camera film processor composed of a camera portion and a processor portion, said camera portion having a camera for recording information on a roll film and said processor portion having a processor for processing the film,

said camera portion comprising a roll film feed-out magazine holding means, a photographing station where the roll film is exposed to imagewise light for photographing, a roll film take-up magazine holding means, film feeding means for feeding a roll film from said roll film feed-out magazine holding means to said roll film take-up magazine

holding means by way of photographing station, and a cutter for cutting the roll film into sheet film after the film has been exposed to the imagewise light,

said processor portion comprising a roll film take-up magazine holding means, and a roll film guiding means for guiding the roll film taken out of the roll film take-up magazine to said processor,

a sheet film guiding means being provided between said cutter and said processor for feeding the cut sheet film from the cutter to the processor.

4,192,595

ELECTROFLASH CONTROLLING CIRCUIT INCLUDING A DELAY CIRCUIT FOR ELECTRICALLY CONTROLLED FOCAL PLANE SHUTTERS

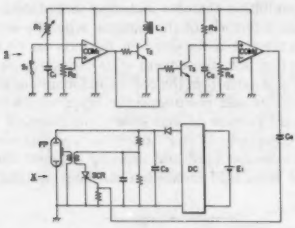
Kenji Wakazono; Yasuo Ishiguro, both of Itabashi, and Toshihisa Saito, Nakano, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Aug. 22, 1978, Ser. No. 935,985

Claims priority, application Japan, Aug. 23, 1977, 52-111960[U]

Int. Cl.² G03B *15/05*

U.S. Cl. 354—133 **4 Claims**



1. An electroflash controlling circuit for electrically controlled focal plane shutters comprising a switch means capable of being switched by the releasing operation of a camera, a first electric delaying means for controlling the exposure time which is connected to said switch means and is made to start its delaying operation by switching said switch means, a first electromagnetic means which is connected to said first electric delaying means and has its operating state converted by the end signal of the delaying operation of said first electric delaying means and can thereby start the shutter closing motion, a second electric delaying means which is connected to said first electric delaying means and is made to start its delaying operation by the end signal of the delaying operation of said first electric delaying means and has a fixed delay time shorter than the time from the issuance of the end signal to the start of the shutter closing motion, and an electroflashing circuit which is connected to said second electric delaying means and is triggered by the end signal of the delaying operation of said second electric delaying means.

4,192,596

CAMERA WITH IMPROVED SHUTTER ARRANGEMENT

Ib Penick, Prospect Heights, Ill., assignor to Camera Plus, Inc., Fairfield, N.J.

Filed Jun. 12, 1978, Ser. No. 914,674

Int. Cl.² G03B *15/03*

U.S. Cl. 354—142 **5 Claims**

1. A camera adapted for use with percussion-ignitable flashlamps, which camera comprises

a housing,

a lens opening in said housing,

a striker element mounted for movement in a straight line direction within said housing between a first loaded position and a second exposed position,

reset means on said striker element for permitting it to be manually moved from said second position to said first position,

a spring biasing said striker element to said second position,

a spring-biased sear lock engageable with said striker element to hold it in the loaded position against the action of said first spring,

a trigger pivotally mounted within said housing,

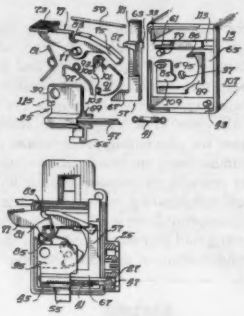
a trigger spring biasing said trigger to a ready position,

said trigger having a part extending exterior of the housing and having an actuator portion for moving said sear lock so as to release said striker element,

said striker element having a pin portion which is aligned with an opening in said housing adjacent a socket for receiving a percussion-ignitable flashlamp,

said pin being proportioned so as to protrude through said aligned opening and actuate said flashlamp when said striker element is moving from said first position to said second position,

a pivotally mounted shutter plate,



spring means biasing said shutter plate to an at-rest position where it blocks said lens opening,

lug means on said shutter plate projecting toward said striker element,

an ear on said striker element projecting toward said shutter plate,

said ear being positioned to hit said lug means and cause said shutter to pivot to a position where it no longer blocks said lens opening and thus allows film exposure to occur,

said spring means having a spring constant such as to maintain said shutter plate in such a non-blocking position for a predetermined amount of time, and

means for halting movement of said striker element in said second position which is located so that said returning shutter plate is halted in an intermediate position by said lug resting against said ear, said shutter plate being proportioned such that it blocks said lens opening in said intermediate position.

4,192,597

PHOTOGRAPHIC APPARATUS FOR SELECTIVELY ACTUATING A PULSABLE ELECTRONIC STROBE

Lawrence K. M. Ting, Bedford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 27, 1978, Ser. No. 955,378

Int. Cl.² G03B *15/03*

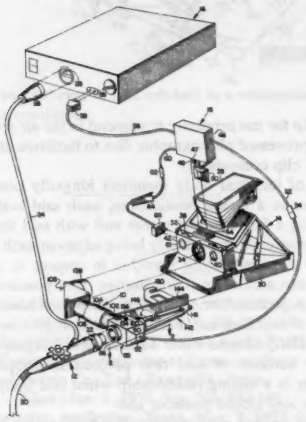
U.S. Cl. 354—145 **12 Claims**

1. Photographic apparatus for use with an electronic strobe of the type which produces a light pulse of given intensity and duration in response to receiving a predetermined input switching signal and has a recharge time which is substantially shorter than the light pulse's duration and with automatic cameras of the type which, upon actuation, begin a photographic cycle during which film exposure commences after a predetermined delay upon the opening of an electro-mechani-

cal shutter and thereafter is automatically terminated by a light sensing circuit which measures scene brightness and commands the shutter to close upon detection of a predetermined exposure value and wherein the predetermined delay time to initiation of film exposure varies from camera to camera within select limits, said apparatus comprising:

means responsive to camera actuation for providing an electrical output signal at the instant the camera is actuated;

means, responsive to said electrical output signal, for presenting to the camera's light sensing circuit at least one predetermined level of illumination equivalent to a predetermined scene brightness by which the camera's shutter is caused, via its light sensing circuit, to remain open for a select time;



electrically actuable means connectable to the strobe for providing to the strobe, upon actuation, the predetermined input switching signal by which the strobe is fired; and

control means, electrically coupled with said electrically actuable means and responsive to said electrical output signal, for actuating said electrically actuable means such that a plurality of strobe input switching signals are provided in a sequence of equal intervals which begins at a predetermined time before the shortest possible camera delay time and terminates after the exposure interval following the longest possible delay time so that whenever a camera of the type is used with the strobe type and said apparatus at least a portion of a strobe pulse will occur during the select exposure interval of this type camera.

4,192,598

MIRROR DRIVING DEVICE FOR USE IN A SINGLE LENS REFLEX CAMERA

Akihiko Sato, and Yoshitaka Araki, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

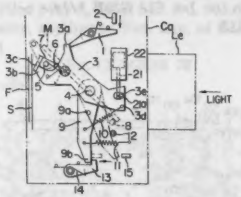
Filed Apr. 12, 1978, Ser. No. 895,614

Claims priority, application Japan, Apr. 19, 1977, 52-44142

Int. Cl.[2] G03B *19/12*

U.S. Cl. 354—153 **5 Claims**

1. A mirror driving device for use in a single lens reflex camera for controlling ascension and descension of a mirror, said device comprising a driving member pivotally mounted to a body of said camera and having an engaging portion, means for holding the mirror, said holding means being operated by means of reciprocating motion of said driving member to control the ascension and descension of the mirror, and biasing means consisting of a first biasing member and a second biasing member both of which are provided on said driving member, said holding means having a portion surrounded by said first and second biasing members and said engaging portion, said first biasing member having relatively strong biasing force and engaging said engaging portion, said second biasing member having relatively weak biasing force and always biasing said holding means so as to cause the mirror to descend, whereby the mirror is raised when said holding means is moved by said



driving member upon forward motion of said driving member and the mirror is lowered when said holding means is moved by said first and second biasing members upon returning motion of said driving member and the mirror is stationed in a viewing-focusing position by pressing said holding means solely with the biasing force of said second biasing member when said driving member returns to its original position.

4,192,599

SWITCH MECHANISM FOR A MOTOR DRIVEN DEVICE

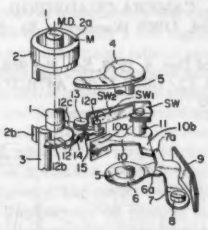
Mikihito Furuya, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 3, 1977, Ser. No. 803,263

Claims priority, application Japan, Jun. 18, 1976, 51-70968

Int. Cl.[2] G03B *1/18, 17/42*

U.S. Cl. 354—173 **3 Claims**



1. A switch mechanism for a motor driven device in a camera provided with the motor driven device for winding a film by an advance lever, said switch mechanism comprising:

a switch for effecting ON-OFF operation of said motor driven device, said switch having a pair of switch contact members; and

switch control means operatively associated with the advance lever to control operation of said switch, said switch control means assuming different positions respectively for the retracted position and the drawn-out position of the advance lever, and said switch control means being engageable with one of said switch contact members;

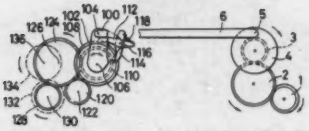
said switch and said switch control means being arranged so that the switch is closed for the retracted position of the advance lever and opened for the drawn-out position of the advance lever.

4,192,600

FILM FEED MECHANISM FOR A SPACED APART TAKE-UP SHAFT AND FILM TAKE-UP SPOOL

Tohru Karikawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 926,066
Claims priority, application Japan, Jul. 19, 1977, 52-96419[U]
Int. Cl.[2] G03B 1/14
U.S. Cl. 354—212 3 Claims



1. In a camera film feed mechanism of the type having a film take-up shaft adapted to rotate in only one direction and a link secured at a first end to a control disc coupled to a take-up shaft, said link exhibiting reciprocating movement in a first direction and a second direction opposite said first direction when said take-up shaft is rotated, the improvement comprising:

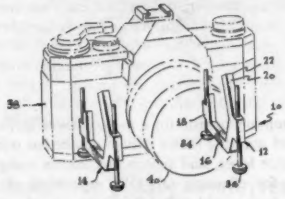
means coupled to said second end of said link for converting said reciprocating movement in both said first and said second directions into a rotational movement of only one direction and for providing said rotational movement to a spool gear associated with said film take-up shaft.

4,192,601

CAMERA QUADRIPOD

Robert S. Frankel, 11905 Woodbridge St. #10, Studio City, Calif. 91604

Filed Dec. 4, 1978, Ser. No. 966,218
Int. Cl.[2] G03B 17/00; A47B 23/00
U.S. Cl. 354—293 17 Claims



1. A camera quadripod comprising:

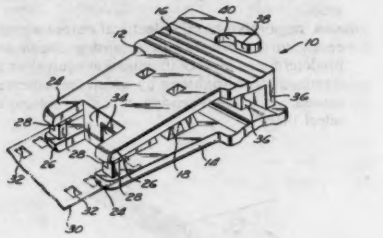
a pair of substantially identical bipods, each of said bipods having first and second spaced arms, one of said arms being resilient, a crossbar interconnecting said arms so that a camera body can be engaged on said crossbar and resiliently detachably embraced within said arms for support of the camera body, each of said bipods having first and second spaced legs, at least one of said legs on each of said bipods being adjustable for supporting said quadripod in a selected position and for supporting a camera engaged within the arms of and supported by said quadripod in a selected position.

4,192,602

PHOTOGRAPHIC FILM CLIP

Kenneth C. Lamoreaux, Jr., 30 San Jano, Goleta, Calif. 93017

Filed Mar. 20, 1978, Ser. No. 890,648
Int. Cl.[2] G03D 13/10
U.S. Cl. 354—346 9 Claims



1. A clip for use primarily to suspend in the air a wet strip of recently processed photographic film to facilitate drying of the film, said clip comprising:

a pair of identical body members hingedly connected together in a facing relationship, each said body member having a fore end and a rear end with said fore end and said rear ends respectively being adjacent each other, said body members being movable in respect to each other between a closed position and an open position;

a first projection formed on each one of said members in the area of said fore end, each said first projection having an irregularly shaped outer surface, said irregularly shaped outer surfaces of said first projections cooperating together in a mating relationship when said body members are in said closed position; and

a pair of second projections located on each of said body members in the area of said rear ends, said second projections extending toward the other of said body members, said second projections to contact the other of said body members when said body members are in said open position to therefore prevent further opening movement of said body members, and when said body members are in said closed position said second projections cooperate together to provide lateral stability between said body members.

4,192,603

REPLENISHABLE PHOTOCONDUCTOR SYSTEM

Kenneth J. Buck, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1978, Ser. No. 946,006
Int. Cl.[2] G03G 15/00
U.S. Cl. 355—3 BE 8 Claims

1. A belt assembly having a replaceable photoconductive belt, including:

a sub-belt;

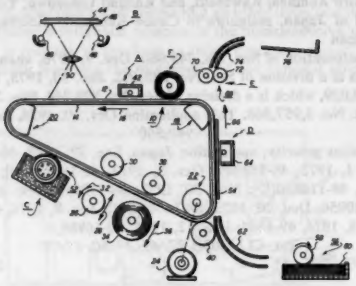
means for supporting movably said sub-belt, said suporting means defining a path about which said sub-belt moves in unison with the photoconductive belt secured releasably thereon;

a supply spool holding the photoconductive belt;

means for moving said supply spool from a position wherein the lead edge of the photoconductive belt contacts said sub-belt so as to be secured releasably thereto to a position remote therefrom with the lead edge of the photoconductive belt remaining secured to said sub-belt; and

means for partially unwinding the photoconductive belt

from said supply spool with said supply spool being in the remote position so that the photoconductive belt moves



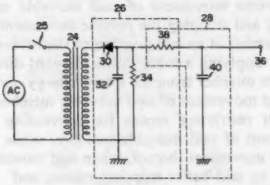
freely and adheres to said sub-belt in a substantially wrinkle-free condition.

4,192,604

BIAS VOLTAGE SOURCE FOR APPLYING A BIAS VOLTAGE ON A MAGNETIC BRUSH MEANS OF AN ELECTROSTATIC PRINTING APPARATUS

Mitsuaki Koyama, Higashikurume, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 1, 1978, Ser. No. 882,141
Claims priority, application Japan, Mar. 9, 1977, 52-25631
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—3 DD **5 Claims**



1. A bias voltage source for applying a bias voltage to a magnetic brush which contacts a photosensitive surface of a rotatable cylindrical drum, comprising:

a transformer whose primary winding is connected to an input power source;

a switch means which is connected between the power source and the primary winding of said transformer and is opened when the rotation of the cylindrical drum is brought to rest;

a rectifier circuit connected to the secondary winding of said transformer and including a series circuit formed of a uni-directional current flow means and an energy storage means, and a protective resistor connected between said uni-directional current flow means and magnetic brush means to protect said magnetic brush means; and

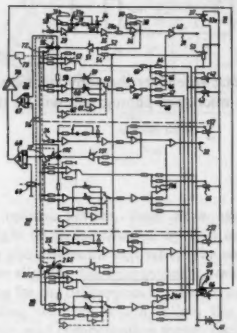
charge storage means connected between said energy storage means and the magnetic brush and including a capacitor connected in parallel to said energy storage means through said protective resistor for the magnetic brush means for slowly attenuating a bias voltage applied to the magnetic brush when said switch means is opened.

4,192,605

METHOD AND APPARATUS FOR MAKING COLOR PRINTS

Berthold Fergg, Taufkirchen; Günter Findeis, Sauerlach, and Wolfgang Zahn, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,691
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722321
Int. Cl.[2] G03B *78*
U.S. Cl. 355—38 **13 Claims**



6. Apparatus for making color prints on color sensitive printing material from color transparencies made on universal film by exposure to light of different color temperature, especially daylight or artificial light, comprising means for uniformly illuminating successive transparencies by light including the three primary colors; and control means including means for ascertaining the density of each transparency and hence the amount of light by which the respective transparency was exposed, means for measuring the integrated transmittances of each transparency in two different colors which transmittances are influenced by the color temperature of light by which the respective transparency was exposed, means for generating for each transparency a first signal a characteristic of which denotes a predetermined ratio of said transmittances, means for comparing said characteristic of said first signal with the corresponding characteristic of a reference signal denoting a threshold value and for generating a third signal denoting the color temperature of light by which the respective transparency was exposed, means for varying said characteristic of said reference signal as a function of the overall density of the respective transparency, and means for regulating the reproduction of each transparency on printing material in dependency on the color temperature of light denoted by the respective third signal.

4,192,606

COMBINATION COPY MACHINE AND MICROFILM CAMERA

Bernard Lewis, 2049 S. Ocean Dr., Hallandale, Fla. 33009

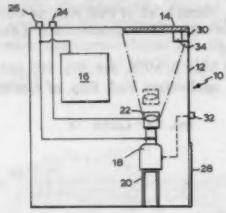
Filed Aug. 16, 1978, Ser. No. 934,095
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—40 **4 Claims**

1. A device for providing a microfilm copy of each document copied on a conventional copy machine and attachable thereto, comprising:

a conventional copy machine including a housing;

a camera, the camera mounted within said copy machine housing and disposed in optical communication with the document holder of said conventional copy machine; and

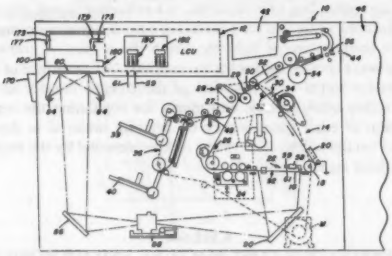
a means for driving said camera for single frame photography connected to the means for actuating the copy machine such that whenever the copy machine is actuated a single frame microfilm photograph will be taken.



4,192,607
APPARATUS FOR SELECTIVELY COPYING DOCUMENTS FROM TWO DIFFERENT DOCUMENT FEEDERS

Charles T. Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1978, Ser. No. 924,106
Int. Cl.[2] G03B *27/48, 27/50*
U.S. Cl. 355—50 5 Claims

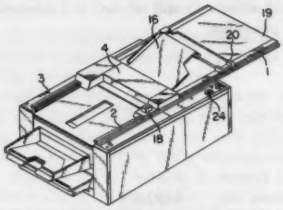


1. Apparatus for feeding document sheets to an exposure station for copying from two spaced locations comprising: means defining a plurality of sheet paths extending from the locations to the exposure station, means for feeding document sheets to the exposure station along each of said paths, and control means for operating said feeding means, said control means including means responsive to the presence of document sheets at both locations for operating the feeding means in a programmed order providing preference for feeding of document sheets to the exposure station for copying first from one location and then from the other location.

4,192,608
COPYING APPARATUS

Yoshitomo Goshima, Yokohama; Hiroyuki Hattori, Mitaka; Shiro Komaba, Kawasaki, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 749,060, Dec. 9, 1976, abandoned, which is a division of Ser. No. 585,602, Jun. 10, 1975, Pat. No. 4,110,029, which is a division of Ser. No. 509,744, Sep. 26, 1974, Pat. No. 3,957,368. This application Oct. 10, 1978, Ser. No. 949,550
Claims priority, application Japan, Sep. 27, 1973, 48-108677; Oct. 1, 1973, 48-111249; Oct. 5, 1973, 48-116829[U]; Oct. 5, 1973, 48-116830[U]; Nov. 30, 1973, 48-135155; Dec. 13, 1973, 48-140956; Dec. 20, 1973, 48-146414[U]; Jan. 8, 1974, 49-5503; Jan. 8, 1974, 49-5504; Feb. 12, 1974, 49-16988
Int. Cl.[2] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 2 Claims



1. A device for controlling a movable member of a copying machine which reciprocates in forward and reverse directions to scan an original, comprising:

a movable member for carrying and reciprocating an original to be copied;

driving means for moving said movable member in forward and reverse directions;

buffer stopping means for absorbing and storing energy from the reverse movement of said movable member while braking and stopping the reverse movement of said movable member at an end position of the reverse movement, and for applying a force in the forward direction to said movable member from the stored energy upon the start of forward movement of said movable member;

movement restricting means for preventing the forward movement of said movable member, while allowing the reverse movement thereof, when said movable member is braked by said buffer stopping means; and

control means for releasing the preventing action of said movement restriction means to enable application of the force in the forward direction from the stored energy in said buffer stopping means to said movable member, when the forward movement of said movable member is to be started.

4,192,609
METHOD FOR EFFECTING REGISTRATION FOR A COPYING APPARATUS

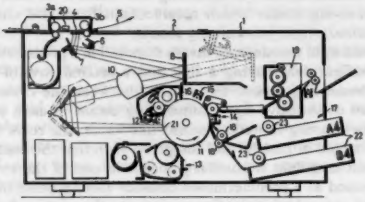
Tatsuo Tani, Tokyo, and Masao Kono, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Mar. 14, 1978, Ser. No. 886,355
Claims priority, application Japan, Mar. 18, 1977, 52-29337; Mar. 22, 1977, 52-30483; Apr. 20, 1977, 52-44539; Apr. 22, 1977, 52-45871
Int. Cl.[2] G03B *27/32;* G03G *15/28*
U.S. Cl. 355—77 4 Claims

1. A method for effecting registration for a copying apparatus having a magnification ratio varying device, in which a photosensitive member in motion is exposed to an optical image of an original by slit exposing to form an electrostatic latent image thereon, by varying the original scanning velocity

in accordance with the magnification ratio selected; such method comprising the steps of:

providing first detection means detecting the leading end of the original in a path of travel of the original, to produce a first detection signal; providing an other detection means detecting a reference position of the photosensitive member in motion, to produce an other detection signal; temporarily stopping the movement of the original after the



lapse of a predetermined time following production of the first detection signal and before exposing the photosensitive member to the original; re-starting the travel of the original after the lapse of a predetermined time following the production of said other detection signal; and delivering a transfer-printing sheet after the lapse of a predetermined period of time following the re-starting of the original, with the predetermined period of time being varied to conform with the selected magnification ratio.

4,192,610

METHOD AND DEVICE FOR THE MEASUREMENT OF PHOTOELASTICITY

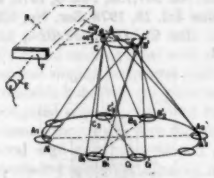
Dimitri Paraskevas, Creil, France, assignor to Centre Technique des Industries Mecaniques, Senlis, France

Filed Apr. 13, 1977, Ser. No. 787,280

Claims priority, application France, Apr. 14, 1976, 76 10923

Int. Cl.[2] G01B *11/18*; G01J *4/00*

U.S. Cl. 356—33 **12 Claims**



1. A method of measurement of photoelasticity wherein said method consists in producing separately at one and the same point of measurement of a specimen of photoelastic material four beams of linearly polarized light by Rayleigh scattering in one direction of observation at right angles to a unitary sheet of said specimen, two of said beams being emitted from a front face of the sheet whilst the two others are emitted from the opposite face or rear face of the sheet so as to pass through said sheet, said beams being produced by Rayleigh scattering respectively from four incident beams which are in turn located in the plane of the front face in the case of the first two beams and in the plane of the rear face in the case of the other two beams, in determining in the common direction of scattering and on each of the four scattered beams the components of the four Stokes vectors representing the corresponding forms of polarized light received externally of the specimen, in determining from said components the elements of the Mueller matrix operator representing the transformation to which the polarized light is subjected as it passes through said sheet, in carrying out the aforesaid determination of the Mueller operator in respect of two different light-wavelengths in succession, and in deducing therefrom the state of mechanical stress in the plane of the unitary sheet.

4,192,611

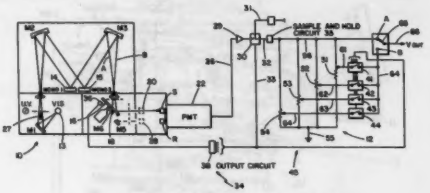
REFLECTIVITY COMPENSATING APPARATUS

Horace T. Jones, Rockville, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 13, 1978, Ser. No. 886,284

Int. Cl.[2] G01J *3/42*

U.S. Cl. 356—320 **7 Claims**



1. In an optical system, such as a spectrophotometer, wherein a light beam is reflected by two or more reflecting surfaces to a photodetector and where the reflectivity of each surface varies slightly, the improvement residing in means for compensating for the differences in reflectivity between two or more reflecting surfaces which reflect the same light to a photodetector, said compensating means including impedance means adapted to be coupled to an output signal channel from the photodetector, said impedance means including at least two different impedances, switch means for coupling the impedance to said output signal channel in a manner to attenuate the output signal on the signal channel and control means for synchronously and cyclically operating said switch means to couple sequentially to the output signal channel a particular impedance related to the reflectivity of the reflecting surface from which the signal then on the signal channel was generated so that output signals generated by the same light and reflected by the two or more reflecting surfaces are equal in value.

4,192,612

DEVICE FOR CONTACT-FREE THICKNESS MEASUREMENT

Viktor Bodlaj, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 647,669, Jan. 9, 1976, Pat. No. 4,068,955. This application Nov. 30, 1977, Ser. No. 856,005

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654478

The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.

Int. Cl.[2] G01B *11/06*

U.S. Cl. 356—381 **9 Claims**

1. A device for contact-free thickness measurement comprising means for contact-free thickness measurement of an object tilted relative to a reference plane, said means including:

light source means for producing a sharply bundled light ray;

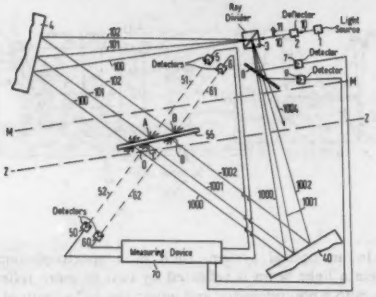
a single light deflector means for deflecting the sharply bundled light ray and a single ray divider means for producing two simultaneously and periodically deflectable light rays to be guided over surfaces of the object;

means for projecting one of the light rays on one surface of the object and the other of the light rays on an opposite surface of the object;

reference detector means for determining a time t_0 at which said two rays corresponding to a zero position of the light deflector means strike the object;

a first detector means for picking up light only along a first sighting line which intersects the object at a first point on one surface thereof, said first detector means detecting a time t_A when a first of the two light rays strikes the first point;

a second detector means for picking up light only along a second sighting line which intersects the object at a second point on said one surface thereof, said second detector means detecting a time t_B when the first light ray strikes the second point;



a third detector means for picking up light only along a third sighting line which intersects the object at a third point on the opposite surface thereof, said third detector means detecting a third time t_C when a second of the two light rays strikes the third point; and

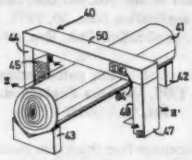
a fourth detector means for picking up light only along a fourth sighting line which intersects the object at a fourth point on the opposite surface thereof, said fourth detector means detecting a fourth time T_D when the second of the two light rays strikes the fourth point.

4,192,613

CONTOUR DETECTING AND DIMENSION MEASURING APPARATUS

Martin Hammar, Erik Sandbergs Gata 21, S-171 34 Solna, Sweden

Continuation of Ser. No. 750,552, Dec. 14, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,644
Claims priority, application Sweden, Jan. 8, 1976, 7600141
Int. Cl.[2] G01B *11/10*
U.S. Cl. 356—386 **7 Claims**



1. Apparatus for detecting the contours of an object, comprising:

(a) a measuring station to and from which said object is moved;

(b) a plurality of light transmitting means at said station for providing a scan of an equal plurality of light rays;

(c) an equal plurality of light receiving means at said station each arranged to sequentially receive light from only a complementary one of said light transmitting means;

(d) each of said light transmitting and light receiving means having a predetermined physical dimension in a predetermined direction, said physical dimension restricting the minimum closeness between two light transmitting and light receiving means, respectively, to an edge-to-edge relationship;

(e) means for guiding said object through the paths of the light rays such that said light receiving means are prevented by said object from receiving light from those of the light rays that shine on one side of each of said contours;

(f) counter means for counting the number of said light receiving means which receive light from said complementary light transmitting means;

(g) said light transmitting means disposed in a predetermined configuration having a first and a second row of light transmitting means, the distance between the centers of two consecutive light transmitting means in each of the rows having a predetermined like value, the rows being arranged in parallel and staggered such that the center of each said light transmitting means in one of the rows is located at a predetermined distance from a point in said one row which point lies opposite to the center of a said light transmitting means in the other row, said predetermined distance being less than said predetermined value and less than said physical dimension;

(h) said light receiving means being disposed in a configuration corresponding to said predetermined configuration; and

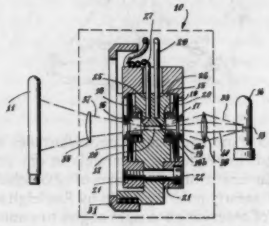
(i) movable light source means being provided to sequentially activate a predetermined number of said light transmitting means alternately in each of said rows such that each of said rows emits a scan of light travelling in said predetermined direction, the scans of the different rows forming a composite scan wherein the distance between two consecutive light rays, as seen along said predetermined direction, is equal to said predetermined distance.

4,192,614

L/C DETECTOR CELL ASSEMBLY

Charles F. deMey, II, West Redding, and Charles C. Helms, Trumbull, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 547,758, Feb. 6, 1975, abandoned. This application Jul. 28, 1978, Ser. No. 928,928
Int. Cl.[2] G01N *21/02*
U.S. Cl. 356—410 **4 Claims**



1. A detector cell assembly for use in a spectrophotometer having a source of radiation and a photodetector with a photosensitive surface spaced from the source, said cell assembly being positionable between the radiation source and the photodetector within the spectrophotometer, and comprising:

a body having an open-ended bore therethrough with radiation transparent windows respectively closing the ends of said bore which thereby defines the spectrophotometer detector cell, said body having an inlet passage and an outlet passage opening into said bore at separate ends thereof for flowing fluid therethrough;

means for providing a heat sink effect whereby the temperature of the fluid flowing through the cell is maintained substantially constant;

optical means for focusing the radiation from the source into said bore with the diameter of the radiation being less than the diameter of said bore; and

energy collecting means interposed between said detector cell and said photosensitive surface for collecting the radiation exiting from said bore and convergently directing it to said photosensitive surface, including the maximum deviated rays of radiation resulting from changes in refractive index of fluid flowing through said cell bore, said energy collecting means and said photosensitive surface being spaced relative to one another such that the maximum deviated rays and principal rays between said energy collecting means and said photosensitive surface intersect in a plane coincident with and defining an area on said photosensitive surface and which area remains substantially constant in size and location on said photosensitive surface for all radiation exiting from the bore;

said area being located between said energy collecting means and its front focal plane.

4,192,615

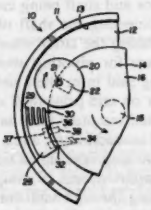
SAND MULLING MACHINE PLOW

Anthony C. Fortunski, Grosse Pointe Park, and Everett G. Gentry, Grosse Ile, both of Mich., assignors to Fargo Machine & Tool Company, Detroit, Mich.

Filed Feb. 23, 1979, Ser. No. 14,708

Int. Cl.[2] B01F *7/20*

U.S. Cl. 366—65 **4 Claims**



1. In a mulling plow for use in a sand mulling machine having a vertically axised mulling bowl with a bottom wall and a generally cylindrical shaped peripheral wall and a vertically axised, central, rotatable hub, with the plow being formed as a generally flat, elongated plate spaced away from, but secured to the hub for rotation therewith, with the plate located adjacent the peripheral wall and being sloped along its longer length dimension relative to the bottom wall, so that its leading length edge, i.e., its narrower edge which leads in the direction of rotation, is close to the bottom wall, and its opposite trailing, edge is spaced a distance above the bottom wall, wherein the plow rotates in a circular path adjacent the peripheral wall and lifts and directs the sand material being mulled upwardly from the bowl bottom wall, that is, from the leading edge, and in an upwardly sloped direction along the upper, elongated surface of the plate and across the trailing edge, the improvement comprising:

the plow trailing edge portion being formed in the shape of a number of spaced apart, narrow, elongated, roughly parallel fingers extending from the trailing edge approximately one-third the length dimension of said plow plate towards the leading edge of the plate to form the rear portion of the plow in a comb-like configuration;

said spaced apart fingers providing spaces between adjacent fingers such that the sand material is lifted upwardly along the sloped surface of said plow plate, the material in part passes between said fingers and in part over the fingers and said material is thereby subjected to a combing-like action as it passes along and leaves the trailing portion of the plate to blend and mix the sand material.

4,192,616

INJECTION UNIT FOR INJECTION MOLDING APPARATUS

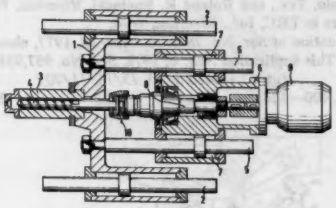
Hermann Spanier, Windhagen, Fed. Rep. of Germany, assignor to Dr. Boy KG, Fernthal, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,094

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2719067

Int. Cl.[2] B29F *1/04*

U.S. Cl. 366—79 **7 Claims**



1. In an injection unit for an injection molding apparatus, having a guide casing, a plasticizing cylinder detachably mounted on said guide casing, a helix mounted for axial and rotational movement within said plasticizing cylinder, and an axially and rotationally reciprocable shaft for actuating said helix, the improvement for detachably coupling said helix to said actuation shaft wherein said actuation shaft has a fork-shaped end forming a slit in the end face of said shaft, said helix is provided with a flattened end for mating with said fork-shaped end of said actuation shaft, said fork-shaped end and said flattened end are provided with respective radially extending boreholes which are co-aligned when said flattened end and fork-shaped end are mated, further including a pin extending through said aligned boreholes and a ring mounted slidably on said actuation shaft for securing said pin in position in said boreholes, said ring being mounted on said actuation shaft for movement between a locking position completely encircling said boreholes and pin to prevent retraction of said pin from said boreholes and an uncoupling position completely axially spaced from said boreholes permitting removal of said pin from said boreholes, and releasable means for securing said locking ring in said locking position.

4,192,617

SCREW EXTRUDER FOR PROCESSING RUBBER OR PLASTICS MATERIAL

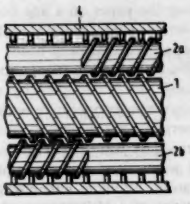
Horst Spielhoff, Aligse, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,436

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719095

Int. Cl.[2] B29B *1/10*; B29F *3/02*

U.S. Cl. 366—83 **9 Claims**



1. A screw extruder for processing rubber and plastics materials comprising a cylinder jacket with a feed hopper, a central geared shaft and geared planet shafts disposed between said

central shaft and said cylinder jacket and drivably engaged with said central shaft and said cylinder jacket, wherein parts of some of said planet shafts are bare of gearing.

4,192,618

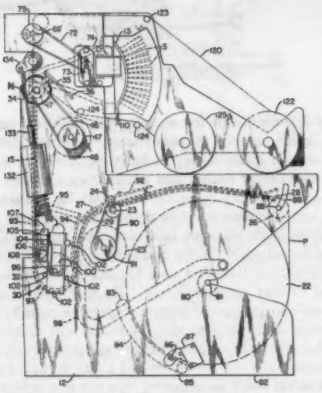
HIGH SPEED TICKET PRINTER

Nicholas Kondur, Jr., Riverton, Wyo.; James E. Blomquist, San Antonio, Tex., and Roland R. Rucinski, Riverton, Wyo., assignors to LRC, Inc., Riverton, Wyo.

Continuation of Ser. No. 782,092, Mar. 28, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,921

Int. Cl.[2] B41J *3/10, 15/16, 11/70*

U.S. Cl. 400—124 **15 Claims**



6. In ticket printing apparatus wherein a print bar is disposed in confronting relation to a print head and a guide path is established for advancement of a length of paper stock from a continuous supply roll betwen the print bar and print head, the combination comprising:

paper drive means stationed in the guide path upstream of said print head for continuously advancing the paper at a predetermined rate of speed along the guide path including means for sensing the rate of advancement of the paper along the guide path and generating signals correlated with such rate of advancement;

a cutter mechanism disposed in the guide path downstream of said print bar including a stationary blade member provided with a cutting edge in proximity and in facing relation to the path of paper travel away from said print head, and a rotary blade including a cutting edge aligned with and in spaced facing relation to the stationary cutting edge, and reciprocal drive means for energizing said rotary blade to shear across said stationary cutting edge whereby to sever the paper on a line normal to its direction of travel without interrupting continuous advancement of said paper past said print head;

tension sensing means for sensing the tension in said paper as it is drawn along said guide path by said paper drive means, and drive means cooperative with said paper drive means when energized in response to increasing tension in said paper as sensed by said tension sensing means to aid in advancing said paper along said guide path; and

an ejector mechanism movable into engagement with the paper downstream of said cutter mechanism including roller drive means to advance the paper as it is severed in a direction away from said cutter mechanism, and deflector means for deflecting the paper as it is severed into a discharge area downstream of said ejector mechanism.

4,192,619

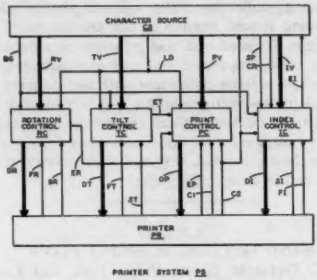
ELECTRONICALLY CONTROLLED PRINTER SYSTEM

Edward H. Lau, Old Westbury, N.Y., assignor to Redactron Corporation, Yaphank, N.Y.

Continuation of Ser. No. 492,692, Jul. 29, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,414

Int. Cl.[2] B41J *1/60*

U.S. Cl. 400—163 **6 Claims**



PRINTER SYSTEM

1. A printer comprising a platen, a rocker means, a print shell having a plurality of type characters thereon, a support means on said rocker means to support said print shell to rotate about a first axis and to tilt about a second axis, a first motor having a shaft, said first motor and shaft being carried by said rocker means, means for connecting the shaft of said first motor to said print shell for rotating the latter whereby a unitary structure is obtained, means for pivoting about a third axis said rocker means carrying said print shell and said first motor to drive a type character on said print shell against said platen, a second motor supported remotely from said rocker means, an arm connected to said second motor, and a link having one end pivotably connected to said arm and a second end pivotably connected to said support means, a straight line joining the ends of said link passing through said third axis about which said rocker means pivots.

2. A printer comprising a platen, a rocker means, a print shell on said rocker means having a plurality of type characters, means on said rocker means for driving said print shell to rotate about a first axis, means for pivoting said rocker means about a pivot axis to drive a type character on said print shell against said platen, a support means on said rocker means to support said print shell to tilt about a second axis, a motor supported remotely from said rocker means, an arm connected to said motor, a link having one end pivotably connected at a first point to said arm and a second end pivotably connected at a second point to said support means, the line connecting said points passing through said pivot axis.

4,192,620

LOOSE LEAF BINDER

Gerhard Jahn, Apt. 1907, 655 Broadview Ave, Toronto, Ontario, Canada

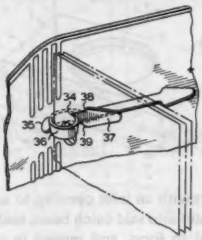
Continuation of Ser. No. 636,817, Dec. 1, 1975, abandoned. This application Jan. 19, 1979, Ser. No. 4,811

Int. Cl.[2] B42F *3/04*

U.S. Cl. 402—15 **4 Claims**

1. A binder of one step construction manufactured from a single sheet of material comprising front and back covers, a spine disposed therebetween joining said covers at hinge lines about which the covers pivot relative to the spine, and forming a continuation of the plane of the adjacent covers, a plurality of fastening means, each fastening means formed integrally from a portion of one of said covers thereby presenting a cut-out portion in the cover corresponding to the shape of the fastening means when a part of the fastening means is lifted from the plane of the binder cover, each of said fastening means com-

prising a thin, narrow, bendable strap and a wider tab, said strap being connected to the cover at one end, said tab being disposed at the other end of said strap, and being of a width at the juncture with the strap to define therewith at least one locking shoulder, a plurality of apertures disposed in said spine, one aperture for each fastening means, each said fastening



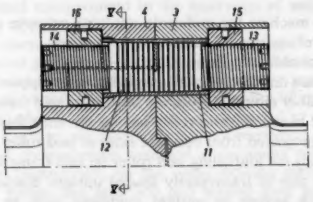
means being inserted through the corresponding aperture for positioning exterior of the binder cover and said tab inserted through the corresponding cut-out portion in the cover to be positioned within the interior of the binder and be locked and secured therein by at least one locking shoulder of said tab engaging cover portions on either side of the cut-out portion.

4,192,621

METHOD FOR INTERCONNECTING TWO SHAFT-ENDS AND A SHAFT COUPLING MADE IN ACCORDANCE WITH SAID METHOD

Aksel Barth, Hisings Backa, Sweden, assignor to Ab Gothenburg Motor, Gothenburg, Sweden

Filed Sep. 26, 1978, Ser. No. 945,912
Int. Cl.[2] F16D *1/02*
U.S. Cl. 403—15 **2 Claims**



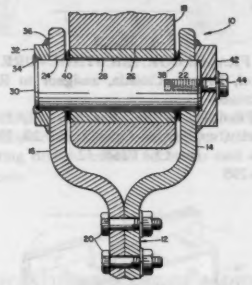
2. A shaft coupling for interconnecting two flanged shaft ends comprising taper pin bolts and expander sleeves cooperating therewith, said bolts and sleeves having the same inner taper, and extending through bores in the flanges, means for fixing the axial position of the sleeves in the respective bores, each pin bolt including a shank located inside a respective sleeve, said shank having cumferential grooves communicating with a feed passage, said passage communicating with the larger end of the taper bolt for the supply of pressure medium to said grooves, said bolt shank having a threaded shaft extension at its smaller end, a nut threaded on said extension, said extension projecting beyond said nut for the connection of a tightening device, said means for fixing the axial position of the sleeves in the bores comprising a locking washer designed to be applied to each said shank extension outside the bore.

4,192,622

ARTICULATED JOINT INCLUDING BELLEVILLE SPRING SEALS MAINTAINED IN A PRESELECTED COMPRESSED STATE

Gary L. Stecklein, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 15, 1979, Ser. No. 20,609
Int. Cl.[2] F16C *11/00*; F16D *1/12*
U.S. Cl. 403—146 **1 Claim**



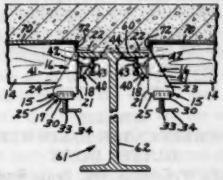
1. In an articulated connection between first and second members, the first member including a pair of parallel portions disposed on opposite sides of and pivotally interconnected to the second member by a pivot pin assembly including aligned holes located in the pair of parallel portions and the second member, a bushing located in the hole of the second member and receiving a pin extending into the holes in the pair of parallel portions, and first and second pairs of opposed Belleville washers located on the pin at opposite ends of the bushing, the improvement comprising: fastening means releasably securing at least one of the pair of parallel portions in place; said pin being fixed to a first one of the pair of parallel portions; a cap disposed against an outer surface of a second one of the pair of parallel portions so as to cover the hole therein; a first end of the pin being received in the cap; and a cap screw extending through the cap and into the pin and holding the pin tight against the cap to thereby effect preselected compression of the pairs of Belleville springs between the pair of parallel portions and the opposite ends of the bushing.

4,192,623

ADJUSTABLE JOIST HANGER

Carl W. Borg, 1040 Garland Ln., Wayzata, Minn. 55391

Continuation of Ser. No. 807,504, Jun. 17, 1977, abandoned, which is a continuation of Ser. No. 617,498, Sep. 29, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,385
Int. Cl.[2] E04G *21/00*
U.S. Cl. 403—232.1 **17 Claims**



1. A joist hanger comprising, in combination:
(a) a body including an elongated flat member;
(b) a support member projecting perpendicularly from the face of said member, in a first direction only, at one end thereof;

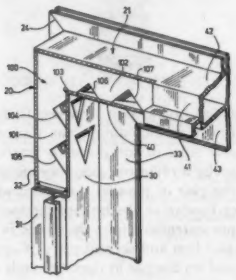
(c) and a pair of parallel walls projecting from said flat member in the opposite direction only and mutually spaced by the thickness of a joist;
(d) joist support means carried by said walls at the end of said body remote from said lip and adjustably projecting between said walls and parallel to said body;
(e) and clamping means removably carried by said flat member and adjustably parallel to said flat member for cooperating with said support member to secure said hanger orthogonally to an object such as the flange of a steel beam.

4,192,624

FRAME CORNER STRUCTURE

Carlo G. Bucci, Bronte, Canada, assignor to Repla Limited, Oakville, Canada

Filed Sep. 8, 1977, Ser. No. 831,521
Claims priority, application Canada, Jul. 20, 1977, 283119
Int. Cl.[2] F16B *12/36*
U.S. Cl. 403—295 **2 Claims**



1. A corner structure for window frames and the like comprising:
a bracket having a pair of angularly disposed legs, each leg being of rigid metal and having a surface opposed to a surface on an adjacent leg, each opposed surface also having a pair of longitudinally spaced triangular depressions therein;
a pair of metal frame members each having a longitudinally extending channel extending from a mitred end, each channel being defined by opposed sides slideably receiving a respective leg of the bracket;
the depression in one surface of each leg nearest the opposed surface of the other leg having a depth less than the depth of the other depression by at least the thickness of the adjacent side of said channel; and
the said adjacent side of each channel having a pair of longitudinally spaced tongues extending in a direction away from the respective mitred end into a respective depression, each tongue engaging at least part of both surfaces of the depression to urge said mitred ends of said frame members together, the two longitudinally spaced depressions in each leg being laterally offset relative to one another, with the tongues in said depressions being correspondingly laterally offset.

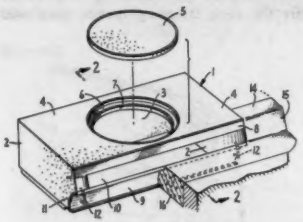
4,192,625

PRECAST CONCRETE CATCH BASIN WITH FORM FOR GUTTER INLET

Harold Peletz, 471 W. College Ave., Santa Rosa, Calif. 95401

Filed Sep. 18, 1978, Ser. No. 942,998
Int. Cl.[2] E01C *11/22*
U.S. Cl. 404—5 **3 Claims**

1. In a catch basin assembly for collecting surface drainage from a street gutter wherein said catch basin has a pair of vertical substantially parallel side walls, a rear wall connecting the side walls and a top slab also connecting said side walls, the improvement comprising:
an integral transverse form attach to and extending across the front of said side walls and spaced from said top slab



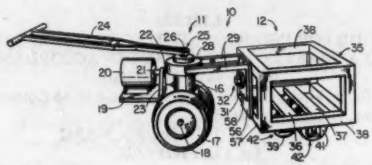
to define therewith an inlet opening to accommodate the passage of water into said catch basin, said transverse form being adapted to form, and remain in place as a water conducting surface for, a cast concrete gutter.

4,192,626

MACHINE FOR APPLYING A UNIFORM PRESSURE

Frank K. Wyckoff, and Roger C. Silver, both of Des Moines, Iowa, assignors to Atlas Products, Inc., Des Moines, Iowa

Filed Dec. 15, 1978, Ser. No. 969,944
Int. Cl.[2] E01C *19/26*
U.S. Cl. 404—123 **4 Claims**



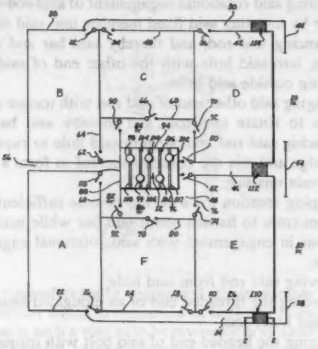
1. In a machine for uniformly applying pressure on a relatively level surface, said machine comprising:
(a) a portable weight bearing frame,
(b) at least one transversely extended frame supporting roller rotatably mounted from the bottom of said frame,
(c) axle means for said roller having the ends thereof laterally projected from opposite sides of said roller, and
(d) means for journaling said roller on said frame including:
(1) a pair of transversely spaced upright bracket means, each having an upright guideway with an adjacent upright surface, and a top end secured to the bottom of said frame,
(2) a pair of bearing means corresponding to said bracket means for receiving the ends of said axle means, each bearing means having a body portion guidably movable in a guideway of an associated bracket means, said body portion including laterally projected flange portions positioned between said associated bracket means and said roller and formed with fulcrum portions rideable on the upright surface of said associated bracket means for pivotal movement of said bearing means with respect to said associated bracket means, and
(3) yieldable pressure means coacting with said bracket means and said bearing means to oppose upward vertical movement of said bearing means.

4,192,627

APPARATUS FOR GENERATING ELECTRICAL POWER

Wilfred J. Casebow, Star Rte. Box 358, Elgin, Ariz. 85611

Filed Sep. 14, 1978, Ser. No. 942,444
Int. Cl.[2] E02B *9/08*
U.S. Cl. 405—76 4 Claims



1. A hydroelectric power generating station for use with tidal waters, said station comprising in combination:

(a) means for generating electrical power in response to a flow of water, said generating means including an upstream side and a downstream side;

(b) a first compartment disposed in fluid communication with said upstream side for maintaining a continuing source of water for said upstream side;

(c) a second compartment disposed in fluid communication with said downstream side for maintaining a continuing receptacle for the flow of water from said downstream side;

(d) a first plurality of reservoirs for supplying water to said first compartment;

(e) first gate means for regulating the source of flow of water to said first compartment from the reservoirs of said first plurality of reservoirs;

(f) first channel and gate means for repienishing the water in said first plurality of reservoirs from the tidal water;

(g) a second plurality of reservoirs for receiving water from said second compartment;

(h) second gate means for regulating the flow of water from said second compartment to the reservoirs of said second plurality of reservoirs;

(i) second channel and gate means for discharging the water in said second plurality of reservoirs to the tidal water;

whereby, said first channel and gate means are actuated to maximize the water levels in said first plurality of reservoirs, said second channel and gate means are actuated to minimize the water levels in said second plurality of reservoirs, said first and second compartments maintain a continuing source and receptacle, respectively, for the water flowing through said gernating means and said first and second gate means are actuated to maximize the water head pressure between said first compartment and said second compartment.

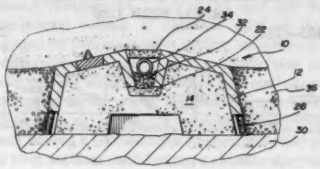
4,192,628

FLOW DISTRIBUTOR FOR LEACHING FIELDS

Edward D. Gorman, Myra Rd., Box 18, R.R. #1, Porters Lake, Halifax County, Nova Scotia, Canada

Filed May 12, 1978, Ser. No. 906,230
Int. Cl.[2] E02B *13/00*
U.S. Cl. 405—45 13 Claims

1. A unit for supporting a perforated liquid supply pipe above an absorption bed and for distributing liquid from said pipe onto said bed, comprising a hollow open-bottomed structure having a top wall and side and end walls defining a central cavity, and wherein said top wall is provided with an upwardly opening longitudinal channel extending along the full length of said top wall and suitable for receiving said supply pipe, said top wall having apertures allowing fluid to flow from said channel into the cavity, and wherein said channel has removable cover means extending along the full length of the top of



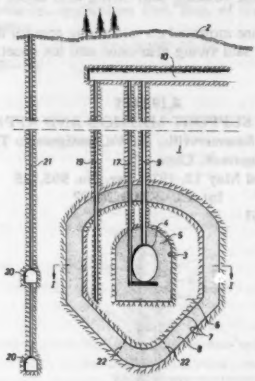
the channel and allowing direct vertical access to the whole length of said channel for lifting of said pipe from the channel and for providing direct vertical access to said apertures for cleaning purposes.

4,192,629

SYSTEM FOR THE STORAGE OF RADIOACTIVE MATERIAL IN ROCK

Tore J. Hallenius, Tegelbruksgatan 93, 852 40 Sundsvall, and Karl I. Sagefors, Klevstigen 22, 170 71 Öregrund, both of Sweden

Filed Dec. 2, 1977, Ser. No. 857,041
Claims priority, application Sweden, Dec. 13, 1976, 7613996; Jan. 19, 1977, 7700552; Mar. 2, 1977, 7702310
Int. Cl.[2] G21F *7/00*; E02D *29/00*
U.S. Cl. 405—128 17 Claims

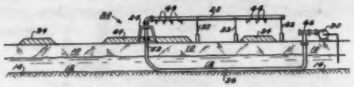


1. An underground repository for the storage of radioactive material and other materials in a rock formation, comprising a first cavity in said rock formation, a first body of rock derived from said rock formation by having been left at the excavation of said first cavity so as to be located within said first cavity and spaced on all sides from the walls of said first cavity, the space between said first body of rock and the walls of said first cavity being filled with a plastically deformable material supporting said first body of rock in said spaced relationship relative the walls of said first cavity, said first body of rock being hollow and containing in its interior storage space for the material to be stored, and shaft means extending through said rock formation, said space filled with said plastically deformable material and said first body of rock to said storage space for the transfer of the material to be stored into said storage space.

4,192,630
METHOD AND APPARATUS FOR BUILDING ICE ISLANDS

Frederick C. Duthweiler, Anchorage, Ak., assignor to Union Oil Company of California, Brea, Calif.

Filed Oct. 18, 1978, Ser. No. 952,547
Int. Cl.[2] E02B 3/00
U.S. Cl. 405—217 27 Claims



1. An apparatus for distributing water onto a sheet of ice floating on a water body overlying a marine bottom in a cold offshore region so as to form a thickened ice mass, said apparatus comprising:

a water pump positioned at a first location on said ice sheet;

a fluid flow conduit comprised of (1) a first water supply line having an inlet end fluid-tightly connected to the outlet of said water pump and having at least a substantial portion of its length disposed in said water body between said ice sheet and said marine bottom, (2) a vertical standpipe fluid-tightly connected to the outlet end of said first water supply line, said standpipe extending through said ice sheet at a second location spaced from said first location, and (3) a horizontal swing arm rotatably and fluid-tightly connected to said standpipe and disposed in an elevated position above said ice sheet;

means for fixedly supporting said standpipe at said second location;

means for supporting said swing arm in said elevated position so as to be rotatable about said standpipe;

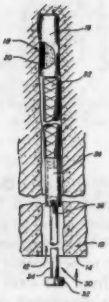
drive means for rotating said swing arm about said standpipe; and

discharge means mounted on said swing arm for discharging water from said swing arm onto said ice sheet.

4,192,631
MINE ROOF SUPPORT METHOD AND APPARATUS

George S. Vass, Summersville, W. Va., assignor to The Eastern Company, Naugatuck, Conn.

Filed May 12, 1978, Ser. No. 905,125
Int. Cl.[2] E21D 20/02
U.S. Cl. 405—261 10 Claims



1. A method of reinforcing a rock formation comprising the steps of:

(a) drilling a blind hole of predetermined dimensions into a face of the rock formation;

(b) inserting a destructible resin cartridge into said hole;

(c) inserting an elongated anchor bar into said hole with the leading end of said bar engaging said cartridge;

(d) said bar on its trailing end being affixed to an internally threaded collar having at least one slot extending axially from the open end thereof for a portion of its length at least partially through the wall thereof for effecting mutual rotational engagement therewith of one end of an elongated rod having a fixed member extending radially therefrom for engagement in said slot;

(e) effecting said rotational engagement of said rod with said collar by inserting said fixed member into said slot;

(f) advancing said rod, and thereby said bar and said cartridge, into said hole with the other end of said rod remaining outside said hole;

(g) engaging said other end of said rod with torque-applying means to rotate said rod, and thereby said bar, while advancing said rod and bar into said hole to rupture said cartridge and mix the contents thereof to form a hardenable resin mixture;

(h) stopping rotation for a period of time sufficient for the resin mixture to harden about said bar while maintaining said bar in engagement with said rotational engagement means;

(i) removing said rod from said hole;

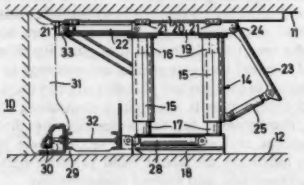
(j) advancing the threaded end of an elongated headed bolt into said hole; and

(k) engaging the headed end of said bolt with torque-applying means to advance said threaded end of said bolt into said internally threaded collar to engage the bolt head with structure engaging the face of said rock formation and tension said bolt to a desired degree.

4,192,632
SUPPORT SYSTEMS FOR MINERAL MINING INSTALLATIONS

Hans E. Von Viebahn, and Julius Tengler, both of Lünen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,475
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732339
Int. Cl.[2] E21D 17/00, 23/06
U.S. Cl. 405—298 20 Claims



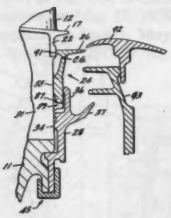
1. A support unit for use in mineral mining, said unit comprising a generally rectangular floor frame structure, hydraulic props carried by the floor frame structure, a generally rectangular roof frame structure supported by the props, a plurality of elongate narrow roof-engaging bars mounted on the roof frame structure, the roof bars being arranged in closely-adjacent side-by-side relationship with each roof bar having a width small in relation to the overall width of the unit, guide means for guiding the roof bars for mutual relative longitudinal displacement in relation to the roof frame structure and hydraulic rams connected between the roof frame structure and the roof bars for selectively displacing the roof bars.

4,192,633

COUNTERWEIGHTED BLADE DAMPER

Frederick C. Herzner, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 28, 1977, Ser. No. 865,343
Int. Cl.[2] F01B 5/30, 5/26
U.S. Cl. 416—221 15 Claims



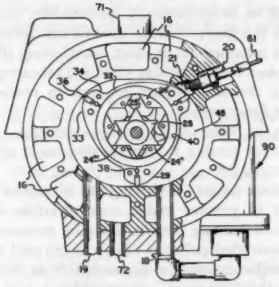
1. A circumferentally segmented blade damper having a lower portion which is restrained in both the radial and axial directions in such a way as to be pivotable in an axial plane, and an upper portion having a pressure bearing surface for axial damping engagement with a blade surface, said damper having a center of gravity which is in a radial plane that is axially spaced from that of the damper's radial restraining point such that when said damper is rotated, centrifugal force causes said pressure bearing surface to pivot against said blade surface.

4,192,634

ROTARY INTERNAL COMBUSTION ENGINE

Adolph A. Campos, and Joseph V. Michele, both of Nutley, N.J., assignors to Campos Associates

Continuation-in-part of Ser. No. 749,642, Dec. 10, 1976, Pat. No. 4,120,620. This application Nov. 23, 1977, Ser. No. 854,290
Int. Cl.[2] F01C 1/02, 17/02, 21/04
U.S. Cl. 418—61 A 1 Claim



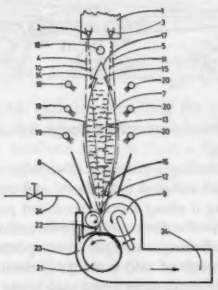
1. In a rotary combustion engine comprising a main housing formed with a generally oval (vertically) horizontally elongated rotor cavity with the middle portion extending slightly inwardly comprising two substantially semi-cylindrical opposed chambers (lower portion, an arcuate top portion at a radial distance from the center of said lower portion greater than the radius of said lower portion, and arcuate upwardly convergent side portions smoothly connecting said arcuate top portion and substantially semi-cylindrical lower portion,) said cavity having a fuel intake port communicating with the cavity at one side of said top portion, fuel ignition means in the cavity adjacent the opposite side of said top portion, said cavity being provided with a peripheral exhaust port in said lower portion at the same side of the cavity as said intake port, a shaft journaled in the housing with its axis displaced from center toward said arcuate top portion, a rotor having a periphery comprising three successive sides of similar shape, means for supporting said rotor on said shaft and respective sealing members on the periphery of said rotor between its successive sides sealing engaging the peripheral surface of said rotor cavity and cooperating with said convergent side portions to cause the rotor to at times assume a depressed position providing a differential of radial distance between the center of the shaft and the portion of said peripheral surface at opposite sides of the ignition means engaged by two successive sealing members whereby to define a differential surface on which combustion pressure in the space immediate adjacent to one of said sealing members to provide a thrust on the rotor, the improvement which comprises utilizing as said means for supporting said rotor on said shaft a shaft having a six-sided star-shaped gear and utilizing as said rotor twin sections each having a circular aperture, a plate positioned in said circular aperature having a six-sided star-shaped aperature and loosely receiving said star-shaped gear so that said gear can not rotate in said star-shaped aperature, and wherein said rotor is connected to means for circulating oil within the rotor, and passage means for delivering the oil to and from the interior of said rotor to said sealing means wherein said passage means comprises a feeding channel extending from the internal portion of the rotor to said sealing means and a fiberous felt band extending around said interior portion of said rotor covering said feed channel to meter the flow of oil to said sealing means.

4,192,635

APPARATUS FOR COOLING AND GRANULATING THERMOPLASTIC STRANDS

Friedrich Hunke, Grossostheim-Ringheim, and Heinz Philipp, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Automatik Apparate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,387
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655840
Int. Cl.[2] B29C 25/00
U.S. Cl. 425—71 7 Claims



1. An apparatus for cooling and granulating thermoplastic strands, comprising spinneret means including two rows of nozzles (2, 3) arranged so that the nozzles in one row are staggered relative to the nozzles in the other row, one single pair of transport rollers (8, 9) arranged below said nozzle means, cooling chute means (6, 7) operatively arranged between said nozzles and said single pair of transport rollers, a single set of chutting means (21) arranged below said transport roller means which form an inlet for said single set of cutting means, cooling liquid supply means arranged for supplying cooling liquid to said cooling chute means (6, 7) substantially at the upper end thereof, said cooling chute means comprising two chutes arranged back to back in mirror symmetrical relationship relative to each other, each chute having a curved guide surface that projects toward the respective strands beyond a plane defined by the respective row of nozzles and said transport roller means whereby the strands from said two rows

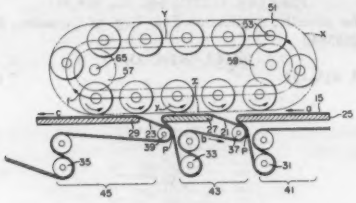
of nozzles are cooled separately, and wherein both guide surfaces have an inward curve portion converging inwardly toward said inlet of the single set of cutting means to such an extent that the cooling liquid remains substantially in contact with the guide surface of the respective chute, whereby the strands are surrounded by cooling liquid along the entire travel path on the chutes, said staggering of said nozzles causing the strands from one row of nozzles to fit into the spaces between the strands from the other row of nozzles and vice versa as the strands are fed to the cutting means, whereby said staggering of said nozzles in combination with said converging of said guide surfaces permits the feeding of a single set of strands from said two rows of nozzles into said single set of cutting means.

4,192,636

APPARATUS FOR STRETCHING DOUGH MATERIAL

Torahiko Hayashi; Takashi Maeda, and Michio Morikawa, all of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Continuation of Ser. No. 716,660, Aug. 23, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 917,968
Claims priority, application Japan, Aug. 22, 1975, 50/102478
Int. Cl.[2] A21C *3/02*
U.S. Cl. 425—96 **8 Claims**



1. An apparatus for stretching dough for cakes, bread or the like, comprising:

(a) means including a plurality of serially arranged conveying members adapted to underlie and support said dough for carrying it along a predetermined path,

(b) a plurality of rollers moveable in unison along a closed roller path having a straight lower portion spaced above and along each of said conveying members, said rollers during their movement along said lower portion being in contact with the dough moving along said predetermined path, and

(c) means operatively associated with said rollers for moving them laterally along said lower portion in the same direction as and at a speed greater than that of said dough so as to compress and stretch it,

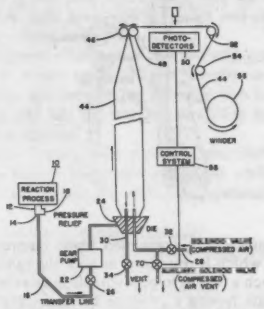
(d) each of said conveying members being constituted by an upper flight of a respective conveyor belt, said belts each moving at a speed greater than that of the nearest upstream conveyor belt so as to stretch said dough in regions between upper flights of adjacent conveyor belts, the upper flights of adjacent conveyor belts being spaced from one another sufficiently so as to provide said regions with a length throughout which the stretching by said belts can be distributed while the regions are unsupported from below so as to receive only a light contact pressure from said rollers as they pass thereover.

4,192,637

INTEGRATED SYSTEM FOR FORMING SHEETS AND FILMS OF SYNTHETIC RESINS

Antonio T. Chong, Taipei, Taiwan, assignor to USI Far East Corporation, Taipei, Taiwan

Filed Jan. 16, 1978, Ser. No. 869,746
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—140 **7 Claims**



1. An integrated commercial system for extruding a commercial end product from a polymer obtained directly from a polymerization reactor, in the absence of intermediate, energy-consuming process steps involved with the use of an intermediate product, comprising:

(a) means for directly withdrawing substantially all of the molten polymer produced by a polymerization reactor, including transfer means for conducting said molten polymer from the polymerization reactor;

(b) an extruder connected to said transfer means and receiving substantially all of said molten polymer withdrawn by said withdrawing means;

(c) a film blowing extrusion die connected to said extruder for forming the extruded polymer into a tubular polymeric product so as to eliminate intermediate steps including cooling the polymer from the reactor, forming it into a suitable intermediate product, transferring the intermediate product to a processing plant and reheating and repressurizing the intermediate product to render the latter suitable for extrusion;

(d) means for flattening said tubular product;

(e) means for sensing the lateral dimension of the tubular product;

(f) ventilation means for venting the interior of said tubular product to prevent undue concentrations of monomer from accumulating therein, whereby monomer dissolved in the extruded polymer which is released interiorly of said tubular product is prevented from building up to potentially explosive concentrations, said ventilation means comprising gas inlet means for introducing fresh gas into the tubular product including a first inlet passageway which is continually open during operation of the system for supplying gas into the tubular product and a second passageway communicating with said first passageway for venting fresh gas therefrom, and gas outlet means continually open during operation of the system for venting monomer-containing gas from said tubular product; and

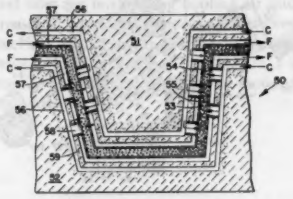
(g) means, responsive to said sensing means, for controlling said ventilation means to maintain the diameter of said extruded tubular product within predetermined limits, including a control valve arranged in said second passageway for regulating gas vented therethrough from said first passageway so as to control the amount of gas flowing through said gas inlet means into the tubular product.

4,192,638

MOLDING DEVICE HAVING HEAT TRANSFER CHAMBERS INSULATED FROM EACH OTHER FOR MOLDING EXPANDABLE THERMOPLASTIC RESIN PARTICLES

Gérard Lezier, 1 boulevard Mariette, 62200 Boulogne-sur-Mer, and Bernard Vasseur, Beaudricourt, 62810 Avesnes-le-Comte, both of France

Continuation-in-part of Ser. No. 796,609, May 13, 1977, abandoned. This application May 19, 1978, Ser. No. 904,220
Claims priority, application France, May 17, 1976, 76 14779
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—256 7 Claims



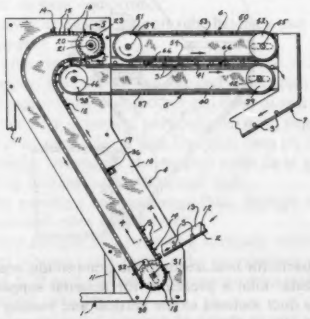
1. A molding device for the production of expanded thermoplastic resin articles from expansible thermoplastic resin particles such as expanded polystyrene beads comprising a plurality of mold cavities defined by two spaced mold elements including molding dies for each mold element, means adapted for feeding said mold cavities with said expansible thermoplastic resin particles to be molded and means adapted for supplying and removing heating and cooling fluids to and from said mold elements, wherein said elements each comprise two superimposed chambers independent and insulated from each other, an outer one of said chambers being a heating chamber, and the other of said chambers being a cooling chamber, said chambers being located substantially parallel with each other and with the surface of the dies defining the mold cavities, separate conduit passages extending from each of said heating chambers, said conduit passages leading to openings in the walls of said mold cavities, said mold being constructed of materials adapted to provide satisfactory mechanical strength during molding at temperatures of about 250° F. and at pressures of about 100 psi.

4,192,639

APPARATUS FOR STRAIGHTENING SAUSAGE LINKS

Edward C. Jones, Jr., Fort Atkinson, Wis., assignor to Jones Dairy Farm, Fort Atkinson, Wis.

Filed Jan. 3, 1977, Ser. No. 756,483
Int. Cl.[2] B29C *15/00*; A22C *17/00*
U.S. Cl. 425—372 9 Claims



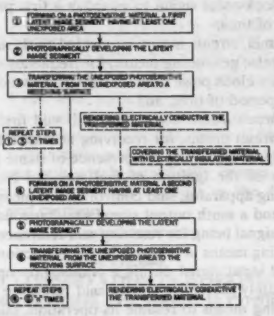
1. An apparatus for straightening elongated generally cylindrical articles, comprising: a first conveyor, said first conveyor being an endless belt, a second endless belt disposed in parallel spaced relation overlying said first conveyor, said first conveyor including a conveyor run having a feed end projecting upstream beyond a corresponding end of said second endless belt, a portion of said feed end being curved about a horizontal axis, a third endless belt feed conveyor spaced from said portion of said feed end and curved around said feed end so as to be adapted to convey said articles deposited on said feed conveyor, between said feed conveyor and said feed end and then deposit said articles on said conveyor run, and drive means operably connected to supporting means for driving cooperating portions of said belts in the same direction.

4,192,640

MULTIPLE TRANSFER PROCESS AND ARTICLE RESULTING THEREFROM

Glenn W. Merry, Lincoln, Mass., assignor to Winter Park Associates, Winnetka, Ill.

Continuation of Ser. No. 602,295, Aug. 6, 1975, abandoned. This application Aug. 17, 1977, Ser. No. 825,445
Int. Cl.[2] G03C *5/54, 5/00*
U.S. Cl. 430—248 27 Claims

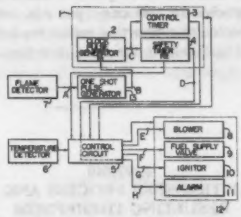


1. A photographic process comprising the steps of:
(1) exposing a first photosensitive material comprising a silver halide emulsion layer to form a first latent image segment having at least one unexposed area;
(2) photographically developing said first latent image segment;
(3) transferring by diffusion the unexposed silver halide from said unexposed area in the developed first latent image segment as a soluble silver halide complex to a receiving surface to form a first silver image thereon by the precipitation of the transferred silver halide from the soluble silver halide complex;
(4) exposing a second photosensitive material comprising a silver halide emulsion layer to form a second latent image segment having at least one unexposed area;
(5) photographically developing said second latent image segment; and,
(6) transferring by diffusion the unexposed silver halide from said unexposed area in the developed second latent image segment as a soluble silver halide complex to said receiving surface to form a second silver image thereon with at least a portion of said second silver image being formed in superposed relation to said first silver image, said second silver image being formed by the precipitation of the transferred silver halide from the soluble silver halide complex and with the diffusion transfer of Step (6) occurring after the diffusion transfer of Step (3).

4,192,641
COMBUSTION CONTROL APPARATUS

Sumio Nakagawa, Tokyo; Toshio Tanaka, Toride, and Kenji Todo, Yanai, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 29, 1977, Ser. No. 865,486
Claims priority, application Japan, Jan. 10, 1977, 52/821
Int. Cl.[2] F23N 5/24, 5/00
U.S. Cl. 431—15 27 Claims



15. A combustion control apparatus of digital type including therein at least a fuel supplying apparatus, a blower, an ignitor and an alarm, comprising:

means for generating a reference clock pulse signal;

first timer circuit means connected with said reference clock pulse generating means, for frequency-dividing said reference clock pulse signal to establish a first predetermined period of time;

second timer circuit means connected with said reference clock pulse generating means, for frequency-dividing said reference clock pulse signal to establish a second predetermined period of time; and

control circuit means connected with said first and second timer circuit means, for receiving at least a first external input signal indicating the presence of flame generated as a result of the ignition of fuel supplied from said fuel supplying apparatus, said control circuit means delivering a first and a ninth output signal simultaneously, said first output signal being for resetting said reference clock pulse generating means in response to the extinction of said first external input signal during a combustion operation and immediately thereafter setting said reference clock pulse generating means to resume its operation, said ninth output signal being for setting said second timer circuit means to start the frequency-dividing operation for establishing said second predetermined period of time, said control circuit means further delivering a fifth and a second output signal simultaneously at the end of said second predetermined period of time established by said second timer circuit means, said fifth output signal being for actuating said ignitor to operate, said second output signal being for setting said first timer circuit means to start the frequency-dividing operation for establishing said first predetermined period of time, said control circuit means further delivering a third output signal for actuating said alarm to operate unless said first external input signal arrives within said first predetermined period of time, thereby stopping the operations of said fuel supplying apparatus, said blower and said ignitor included in said combustion system.

4,192,642
UNIVERSAL PILOT ASSEMBLY

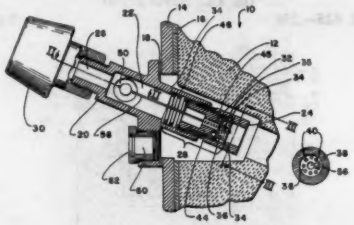
Roman F. Lempa, Philadelphia, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Apr. 17, 1978, Ser. No. 897,209
Int. Cl.[2] F23Q 7/06
U.S. Cl. 431—263 24 Claims

1. A pilot flame assembly suitable for generating a pilot flame for igniting the main flame of a furnace comprising:

(a) a housing having a central passageway extending longitudinally through said housing, said central passageway having a pilot flame emitting end;

(b) a first port accommodating a semiconductor flame detection means at an end of the central passageway opposite said pilot flame emitting end, the opening of said first port being in communication with the central passageway in a substantially coaxial relationship, said semiconductor flame detection means constructed for detection of the pilot flame or the main furnace flame by sensing the emitted radiation of said flames;



(c) a baffle assembly within said central passageway and coaxially disposed to said first port, said baffle assembly in proximity to the pilot flame emitting end;

(d) an inlet port for accommodating a fuel-air mixture;

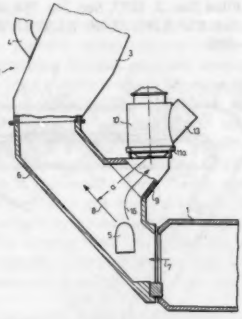
(e) a second port accommodating a spark ignition means, the openings of said second port and inlet port communicating with said central passageway; and

(f) a third port mating with means for viewing the pilot flame of said pilot assembly, said third port being disposed below said first port, the opening of said third port having an axis which is at an angle with respect to the axis of said central passageway.

4,192,643
APPARATUS FOR HEAT TREATING FINE-GRAIN SOLIDS

Karl Krutzner, Jr., Beckum, Fed. Rep. of Germany, assignor to Polysius AG, Beckum, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,261
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742099
Int. Cl.[2] F27B 7/02
U.S. Cl. 432—106 4 Claims



1. Apparatus for heat treating fine grain solids, comprising a rotary tubular kiln, a preheater for material supplied to the kiln, and a duct inclined to the vertical and leading from one end of the kiln to the preheater, for conducting waste gases from the kiln to the preheater, wherein the improvement comprises

(a) a bypass conduit connected to the upper wall of said inclined duct for diverting part of said waste gases, which extends from the duct at an angle of about 90°,

(b) an upright mixing chamber which is connected at its bottom to said bypass conduit to cause said diverted stream of gases to flow upward through said mixing chamber,

(c) the lower portion of the interior of said mixing chamber is funnel shaped, and the initial section of the bypass conduit which opens into said mixing chamber has the form of a short chute-like pipe;

(d) said mixing chamber having in its lower portion at least one lateral inlet for introducing cooling air into said diverted stream of gases, and the distance between the axis of said duct and a point on the axis of said mixing chamber at the level of said inlet being from 1.5 to 3 times the square root of the quotient of the cross-sectional area of the duct divided by pi.

4,192,644

COOLED GRATE FOR SUPPORTING A WORKPIECE IN AN OVEN

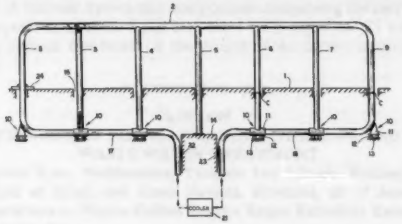
Heinz Westerhoff, Jakobstrasse 36, and Wilhelm Riege, Brandsheide 24a, both of 4330 Mülheim, Ruhr, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,493

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2713014

Int. Cl.² F27B 9/14

U.S. Cl. 432—122 **10 Claims**



1. A grate element comprising:

a horizontally elongated support tube having a pair of ends;

a fixed support;

a supply tube extending generally parallel to and underneath said support tube and having one end underneath one end of said support tube and another end fixed to said support;

a connector tube extending vertically between supply tube and said support tube at said one ends thereof, whereby said supply, connector, and support tubes form a circulation loop terminating at said other ends;

means for passing a heat-exchange fluid through said loop between said other ends thereof;

at least one upright post extending vertically between said support tube and said supply tube intermediate said ends thereof with said support tube supported by said post on said supply tube; and

means supporting said supply tube except at said other end for displacement on said support in a direction parallel to said supply tube.

4,192,645

TUNNEL OVEN FOR BAKING CERAMIC PRODUCTS

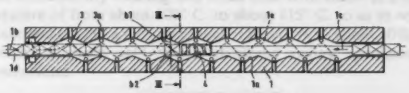
Andreas Hassler, Jahnstr. 45, D-7904 Erbach, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,765

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705783; Oct. 6, 1977, 2744975; Nov. 26, 1977, 2752949

Int. Cl.² F27B 9/00

U.S. Cl. 432—144 **19 Claims**



1. A tunnel oven for baking ceramic products, said oven comprising a tunnel of elongated configuration having at least one movable carriage therein for carrying products to be baked from one end of the tunnel to the other, gas-producing means for producing a stream of heated gas which flows along the length of said tunnel through a first distance opposite to the direction of movement of said carriage and thereafter through a lesser distance in the direction of movement of said carriage whereby said stream of gas flows in reciprocating fashion through said tunnel in a general direction opposite to the direction of movement of said carriage, each inner side wall of said tunnel including a plurality of inwardly extending projections spaced from one another by recesses, said gas-producing means comprising fire producing means located in each of said recesses, the inwardly extending projections on each of said side walls being disposed respectively opposite to the recesses on the other of said side walls, said projections and recesses being operative to produce cross currents in said reciprocating stream of heated gas which causes said stream of heated gas to flow through said recesses and fire producing means along a generally sinuous path which periodically crosses the axis of said tunnel in a flow direction opposite to the direction of movement of said carriage.

4,192,646

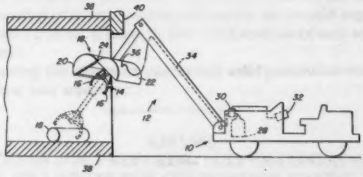
HEAT CONSERVATION IN WORKPIECES

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Filed Mar. 20, 1978, Ser. No. 888,211

Int. Cl.² F27D 3/00, 5/00

U.S. Cl. 432—239 **8 Claims**



1. In an apparatus for transporting a workpiece that is at a temperature substantially above the ambient, the apparatus including support means for supporting the workpiece, the improvement wherein said apparatus includes enclosure means including an interior surface coating positioned to be exposed to but separated from a workpiece supported in said support means and formed from a material that is highly reflective of radiant infrared energy, said enclosure means comprising at least two segments, at least one of which is movable relative to the other between a first open configuration facilitating entry of a workpiece therebetween and a second closed configuration in which said interior surface of said enclosure means substantially surrounds said support means and said workpiece.

4,192,647

PRINT PASTE FORMULATIONS WITH HYDROXYALKYL CARBOXYALKYL CELLULOSE

William C. Kuryla, Saint Albans, and Russell H. Raines, Nitro, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,896
Int. Cl.[2] D06P *1/48*
U.S. Cl. 8—62 7 Claims

1. In a print paste formulation containing water and a dye chosen from the group consisting of acid metallized and neutral metallized dyes, the improvement which comprising having hydroxyalkyl carboxyalkyl cellulose present therein as a thickener.

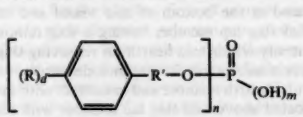
4,192,648

CATIONIC DYE CARRIER AND SELECTIVE PROCESS FOR DYEING POLYESTERS

Roop C. Nahta, Charlotte, N.C., assignor to GAF Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,689
Int. Cl.[2] D06P *1/667, 3/854, 3/87*
U.S. Cl. 8—86 5 Claims

1. A dye carrier composition for cationic dyestuffs wherein the active carrier is a mixture consisting essentially of from about 50 to about 85 wt% phenoxyethanol; from about 5 to about 45 wt% of the triethanol amine salt of a phenoxy poly (ethyleneoxy) phosphonic ester having the formula:



wherein n is a whole integer of 1 or 2; m is 3-n; d is 0 or 1; R' is a mixture of polyoxyethylene units averaging 8, 9, 10, 11 and 12 units and R is alkyl having from 4 to 18 carbon atoms and between about 0 wt% and about 45 wt% butylbenzoate.

5. A cationic dye-carrier composition comprising the carrier composition of claim 1 and between 4 wt% and about 25 wt% of a cationic dye based on the weight of the carrier composition.

4,192,649

PROCESS OF SIZING, WEAVING, DESIZING AND WASTE WATER TREATMENT

Hiroshi Kato, Nishinomiya; Yoshiaki Ito; Hiroshi Tokonami, both of Itami, and Atsuo Sawada, Hirakata, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1978, Ser. No. 874,349
Claims priority, application Japan, Feb. 1, 1977, 52-10383
Int. Cl.[2] D01C *3/02;* B01D *5/00*
U.S. Cl. 8—138 10 Claims

1. A process of sizing, weaving, desizing and waste water treatment which comprises the steps of

(1) sizing a warp by employing a sizing liquid containing a low-hydrolyzed polyvinyl alcohol having a degree of hydrolysis of 50% to 80% by mole and an average degree of polymerization of not less than 400 and an anionic surface active agent capable of solubilizing said polyvinyl alcohol in water or capable of raising the cloud point of said polyvinyl alcohol, and then weaving,

(2) subjecting the obtained woven cloth to desizing in a scouring bath, and washing the cloth, and

(3) treating the resulting desizing and washing waste water with an agent selected from the group consisting of polyvalent metal salt chelate-forming agents, strong acids and cationic compounds by adding said agent to the waste water to deposit the polyvinyl alcohol, and separating the deposited polyvinyl alcohol.

4,192,650

PROCESS FOR DRYING AND STABILIZING COAL

Walter H. Seitzer, West Chester, Pa., assignor to Sunoco Energy Development Co., Dallas, Tex.

Filed Jul. 17, 1978, Ser. No. 925,575
Int. Cl.[2] C10L *5/00*
U.S. Cl. 44—1 R 5 Claims

1. A process for stabilizing lignitic and subbituminous coal containing from about 25 to about 40% by weight water which comprises drying said coal to essentially zero percent moisture and subsequently treating said dried coal with steam at a temperature of from about 100° C. to about 115° C. so as to rehydrate said coal to a moisture level of from 2% to about 10% by weight, whereby said coal is stabilized against spontaneous combustion.

4,192,651

METHOD OF PRODUCING PULVERULENT CARBONACEOUS FUEL

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 853,031, Nov. 22, 1977, Pat. No. 4,146,366. This application Aug. 21, 1978, Ser. No. 935,351
Int. Cl.[2] C10L *9/10*
U.S. Cl. 44—1 SR 8 Claims

1. A method of producing dry, pulverulent, highly-reactive particulate fuel of low density, high porosity, and high permeability, from a fluid material comprising carbonaceous fuel particles and alcohol, comprising the steps of:

pressurizing said fluid material to a level sufficient to prevent vaporization of liquids or solids during heating to a temperature T1,

heating said pressurized material under pressure to a temperature T1 sufficient to effect single stage flashing of substantially all of the alcohol and high enough that the temperature of the remaining solids after the single stage flashing of substantially all of the alcohol is above the condensing temperature T2 of said alcohol and any water vaporized therewith,

passing said heated fluid material to expansion means to reduce the pressure rapidly to initiate flashing and vaporization of substantially all of the alcohol in said fluid material as well as other volatized materials and leave a puffed, dry, pulverulant, highly-reactive particulate fuel as the solids, and maintaining said solids above the temperature T2 until after said vapors that have been flashed have been separated from said solids,

passing the resulting solid particulate material and vapor mixture from said expansion means to a gas-solids separator means to separate the vapors from the solid particulate material while maintaining said solids above said temperature T2 so as to prevent said condensation of said vapors, and

removing the separated vapors and solid particulate material from said separator.

4,192,652

PROCESS FOR PREPARING SULFUR-CONTAINING COAL OR LIGNITE FOR COMBUSTION HAVING LOW SO_2 EMISSIONS

Robert H. Smith, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1977, Ser. No. 864,569
Int. Cl.[2] C10L *5/00, 9/10*
U.S. Cl. 44—10 R 6 Claims

1. A process for preparing sulfur-containing coal or lignite for combustion having low SO_2 emissions, which comprises in combination:

(a) reducing the particle size of said coal or lignite;

(b) deeply cleaning said coal or lignite of reduced particle size;

(c) admixing said clean coal or lignite with a finely divided inorganic material selected from the group consisting of

an oxide; hydroxide; or carbonate of sodium, potassium, calcium or barium; and dolomite;

(d) forming said resulting admixture into large particles.

5. The process of claim 1 wherein said large particles are pellets or briquettes.

4,192,653

NOVEL FUEL COMPOSITIONS COMPRISING UPGRADED SOLID AND/OR SEMI-SOLID MATERIAL PREPARED FROM COAL

Joseph P. Giannetti, Allison Park, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1977, Ser. No. 865,607

Int. Cl.[2] C10L 1/00; C10G 1/06

U.S. Cl. 44—51 **12 Claims**

1. Novel fuel compositions comprising:

(A) a solid and/or semi-solid material formed by a process for producing an upgraded material which is solid and/or semi-solid at room temperature having a substantially lower ash, sulfur and nitrogen content from coal containing from about 0.1 to about 30 weight percent ash, from about 0.25 to about 2.5 weight percent nitrogen and from about 0.3 to about 10 weight percent sulfur consisting essentially in the steps of (1) subjecting a slurry composed of said coal containing ash, nitrogen and sulfur and a solvent containing donatable hydrogen, together with hydrogen, to substantially catalyst-free hydrogenation conditions in a first hydrogenation zone wherein the temperature is in the range of about 343° to about 510° C., the pressure is in the range of about 500 to about 5000 psig, the solvent to coal weight ratio is in the range of about 0.5/1 to about 10/1, the hydrogen/coal feed weight ratio is in the range of about 0.01 to about 0.30/1, the hydrogen gas purity is in the range of about 85 to about 100 mole percent and the residence time is in the range of about 0.1 to about 5.0 hours, to form an intermediate coal-solvent slurry; (2) deashing said intermediate coal-solvent slurry to form a coal-solvent solution, said coal-solvent solution being such that in the absence of solvent therein at ambient temperature and pressure left behind would be deashed coal; (3) subjecting said coal-solvent solution to catalytic hydrogenation in a second hydrogenation zone in the presence of a catalyst consisting essentially of nickel, titanium and molybdenum wherein the temperature is in the range of about 260° to about 538° C., the pressure is in the range of about 500 to about 10,000 psig, the liquid hourly space velocity is in the range of about 0.3 to about 10 volume feed/volume catalyst/hour and the hydrogen flow rate is in the range of about 25 to about 190 kmol H_2/m^3 feed to obtain a liquid product, (4) separating said liquid product to obtain (a) said desired upgraded material which is solid and/or semi-solid at room temperature having a substantially lower ash, sulfur and nitrogen content than the coal charge, (b) a first liquid fraction boiling at a temperature in the range of about 100° to about 375° C. and (c) a second liquid fraction boiling above said first liquid fraction at a temperature in the range of about 200° to about 525° C.; and then (5) recycling at least a portion of said second liquid fraction to said first hydrogenation zone; and

(B) a light-boiling hydrocarbon stock boiling at a temperature in the range of about 100° to about 375° C. at ambient pressure.

4,192,654

COAL GASIFICATION PLANT

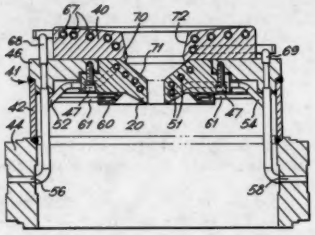
Charles T. Brooks, Kinross, Scotland, assignor to British Gas Corporation, London, England

Filed Oct. 16, 1978, Ser. No. 951,459

Claims priority, application United Kingdom, Sep. 8, 1978, 36126/78

Int. Cl.[2] B01J 3/00

U.S. Cl. 48—62 R **4 Claims**



1. A coal slagging gasifier comprising: a gasifying vessel; means for introducing coal into said vessel for gasification thereof in said vessel; means for introducing oxygen and steam into said vessel to effect gasification of coal therein; and a hearth located at the bottom of said vessel and including a liquid cooled slag tap member having a slag removal orifice located centrally within said hearth for removing slag from the vessel; wherein said hearth further includes a removable liquid cooled annular hearth member and in contact with said slag tap member located above said slag tap member with the opening in said annular hearth member being vertically aligned with said orifice for discharge of slag therethrough.

4,192,655

PROCESS AND APPARATUS FOR THE CONVEYANCE OF REAL GASES

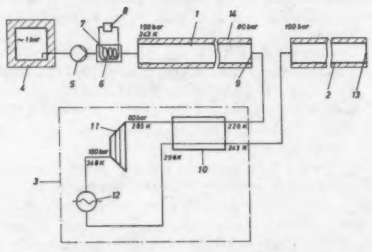
Robert von Linde, Gräefelfing, Fed. Rep. of Germany, assignor to Caloric Gesellschaft fur Apparatebau m.b.H., Graefelfing, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,644

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732428; Jan. 24, 1978, 2802881

Int. Cl.[2] F17D 3/00

U.S. Cl. 48—191 **19 Claims**



1. A method of conveying real gases over long distances by means of a pipeline having a plurality of sections connected in series by; providing between said sections one or more compressor stations to compensate for the pressure loss in the preceding pipeline section, controlling the pressure and temperature of the gas at the start of each pipeline section so that a lowering of gas temperature results from the Joule-Thompson effect created by the drop in pressure in the pipe section, and using this low temperature gas for re-cooling the gas

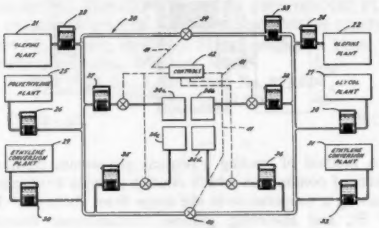
heated by compression at one of said compressor stations, before entry into the next pipeline section.

4,192,656

METHOD AND APPARATUS FOR HALTING THE ADVANCEMENT OF ACCIDENTAL ETHYLENE DECOMPOSITION IN A GAS PIPELINE

G. Richard Worrell, Media, Pa., and Frank F. McKay, Jr., Baytown, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 15, 1977, Ser. No. 860,791
Int. Cl.[2] F17D *1/02, 1/04*
U.S. Cl. 48—192 **6 Claims**



1. In a system for the pipeline flow of compressed ethylene along relatively great distances, wherein non-catalytic decomposition of ethylene to form carbon, miscellaneous products, and methane is an exothermic reaction which can advance from a point of origin in various directions, the method of halting the advancement of a reaction boundary of such decomposition reaction which consists of:

controlling the path of the compressed gaseous ethylene so that, at appropriate zones of contemplated flow of ethylene, the ethylene instead of flowing through a conventional portion of a gas pipeline, is directed through an array of narrow tubes having cross-sectional dimensions of not more than 4 centimeters and having a length greater than a meter, and

cooling the ethylene in said plurality of narrow tubes by transferring heat from the ethylene to a liquid normally maintained below about 150° C., whereby the compressed ethylene flowing throughout the entire length of said narrow tubular stream is quenched to a temperature below the decomposition temperature of ethylene at such conditions.

4,192,657

METHOD AND APPARATUS FOR HALTING THE ADVANCEMENT OF ETHYLENE DECOMPOSITION FLAME FRONTS

G. Richard Worrell, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 3, 1978, Ser. No. 921,546
The portion of the term of this patent subsequent to May 31, 1996, has been disclaimed.
Int. Cl.[2] F17D *1/02, 1/04*
U.S. Cl. 48—192 **2 Claims**

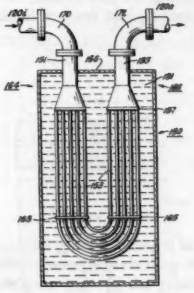
1. The method of halting the advancement of ethylene decomposition flame fronts within a control zone in a system for the pipeline flow of ethylene along a relatively great distance, there being a hazard of accidental advancement of one or more flame fronts, which method consists of:

controlling the path of the compressed ethylene so that, at appropriate control zones of contemplated flow of said ethylene, the ethylene instead of flowing through a conventional portion of an ethylene pipeline is directed through an array of narrow tubes having cross-sectional dimensions of not more than 4 centimeters and having a length greater than a meter, said tubes following a path which is a return loop connecting with adjacent portions of said pipeline system, and

cooling the ethylene in said plurality of narrow tubes by transferring heat from the ethylene streams to a liquid normally maintained below about 150° C., said liquid having an upper surface so exposed that vapor may evaporate from such upper surface, said tubes normally being immersed significantly below said upper surface of said liquid, whereby the compressed ethylene flowing throughout the entire length of said narrow tubes is cooled and quenched to a temperature below the decomposition temperature of ethylene at such conditions.

2. In a system for the pipeline flow of compressed ethylene along relatively great distances, there being a hazard of accidental advancement of one or more ethylene decomposition flame fronts which can advance through the pipeline system from a point of origin, the apparatus for halting the advancement of flame fronts which consists of:

an array of narrow tubes having a length of at least 1 meter and an internal diameter of not greater than about 4 centimeters through which said compressed ethylene flows



each tube following a path which is a return loop maintaining structural integrity during expansion and contraction attributable to rapid changes of temperature;

a shell defining a vat, said vat containing a pool of liquid normally maintained at about ambient temperature, the upper surface of the pool of liquid being exposed to the surroundings in such manner that vapor may evaporate from the upper surface of the liquid, said array of tubes being immersed significantly below the surface of said pool of liquid;

entry means connected to the ethylene pipeline system directing ethylene flowing from an upstream portion of an ethylene pipeline through an entry pipe into the entry zone of said return loop; and

exit means connected to the ethylene pipeline system directing ethylene flowing through said plurality of tubes, through an exit zone of said return loop toward a downstream portion of said ethylene pipeline, said exit pipe being closely adjacent the entry pipe, and said upstream portion of the pipeline being closely adjacent said downstream portion of said pipeline system.

4,192,658

PIPELINE FLAME ARRESTOR

G. Richard Worrell, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 3, 1978, Ser. No. 921,636
Int. Cl.[2] F17D *1/02, 1/04*
U.S. Cl. 48—192 **1 Claim**

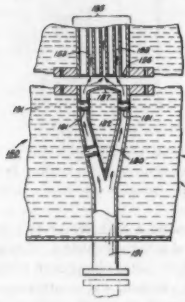
1. Apparatus for halting the advancement of ethylene decomposition flame fronts advancing thereto which apparatus consists of:

an array of narrow tubes having a length of at least 1 meter

and an internal diameter not greater than about 4 centimeters through which an ethylene gas stream flows, there being relatively large zones for heat transfer liquid between adjacent tubes, whereby the cross section of the array of tubes is significantly larger than the cross section of an ethylene pipeline with which said array of narrow tubes is connected, said pipeline being used for distributing ethylene to a plurality of customers;

structural means for maintaining the exterior of said array of narrow tubes submerged in a pool of heat transfer liquid normally maintained at about ambient temperature, and adapted to cool the ethylene gas flowing within said array of tubes to a temperature below about 150° C., whereby in the event of the advancement of a flame front into one end of the array of narrow tubes the flame front is cooled and quenched to below reaction temperature before such flame front can advance to the other end of such tubes;

liquid-cooled entry means directing gas flowing through an entry pipe connected to an upstream portion of said ethylene pipeline into said array of tubes, the cross section of said array of tubes being significantly larger than the cross section of said entry pipe, said entry means comprising a wall encompassing the gas stream, the opposite side of said wall contacting said pool of liquid, and said entry



means comprising hollow baffle means, conduit means connected to said hollow baffle means and said pool of heat transfer liquid for circulating heat transfer liquid between the hollow of said baffle means and said pool of heat transfer liquid and said hollow baffle means being spaced from said wall encompassing the gas stream, said baffle means providing a cross-sectional area for gas flow maintaining the gas flow velocity at about the speed in the pipeline;

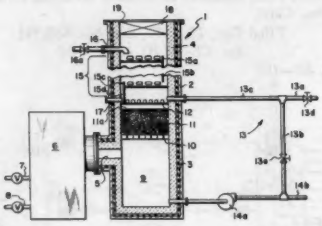
liquid-cooled exit means directing gas flowing through said array of tubes into an exit pipe connected to a downstream portion of said ethylene pipeline, the cross section of said array of tubes being significantly larger than the cross section of said exit pipe, said exit means comprising a wall encompassing the gas stream, the opposite side of said wall contacting said pool of liquid, and said exit means comprising hollow baffle means, conduit means connected to said hollow baffle means and said pool of heat transfer liquid for circulating heat transfer liquid between the hollow of said baffle means and said pool of heat transfer liquid and said hollow baffle means being spaced from said wall encompassing the gas stream, said baffle means providing a cross-sectional area for gas flow maintaining the gas flow velocity at about the speed in the pipeline.

4,192,659

METHOD FOR HOT GAS COOLING AND GASEOUS CONTAMINANT REMOVAL

Yen-Hsiung Kiang, Collegeville, Pa., assignor to The Trane Company, La Crosse, Wis.

Filed Aug. 7, 1978, Ser. No. 931,580
Int. Cl.[2] B01D *47/14*
U.S. Cl. 55—89 **8 Claims**



1. A method of cooling a process gas stream comprising products of combustion which contain gaseous contaminants and having a temperature in the range from about 400° F. to 3000° F., and absorbing gaseous contaminants therefrom wherein contact is effected between said process gas stream and respective quench and absorbent liquids in order to provide said cooling and absorbing functions, the flow rates of said process gas stream, quench liquid, and/or absorbent liquid being subject to substantial variations; said method comprising the steps of

a. passing said gas stream through a first treatment column in contact with a quench liquid in order to at least cool said process gas stream, said first treatment column being of the packed, differential type exhibiting an adequate cooling efficiency over said substantial variations in flow rates of said process gas stream and/or quench liquid; and

b. passing the cooled process gas stream from said first treatment column through a second treatment column in contact with an absorbent liquid to at least absorb a portion of said gaseous contaminants from said process gas stream and thereby produce a concentrated absorbent liquid, said second treatment column being of the equilibrium-stage type exhibiting an adequate absorption efficiency over said substantial variations in flow rates of said process gas stream and/or absorbent liquid;

whereby the flow rates of said process gas stream, quench liquid, and/or absorbent liquid may undergo said substantial variations without substantial effect upon the adequate cooling of or contaminant removal from said process gas stream.

4,192,660

AIR CLEANER INCLUDING NOISE-LIMITING COOL AIR INTAKE NOSE

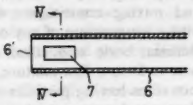
Takashi Ishidera, Aichi, and Masahiko Enjoji, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 19, 1978, Ser. No. 897,596
Claims priority, application Japan, Apr. 20, 1977, 52-48901
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—276 **4 Claims**

1. In a combined air cleaner and cool air intake pipe for a carburator of an internal combustion engine for use within an engine compartment of an automobile, said air cleaner comprising an air inlet, and said cool air intake pipe having front and back open ends and being connected at said back end to said inlet with the front end of said cool air intake pipe being adapted to be located at the front end of said engine compartment, the improvement comprising:

means to reduce noise within the automobile by reducing air

column resonance within said cool air intake pipe including a tuning hole passing through the wall of said cool air



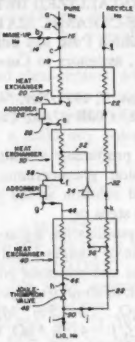
intake pipe on the underside thereof and adjacent the front end thereof.

4,192,661

ADSORBING IMPURITIES FROM CRYOGENIC FLUID MAKE-UP PRIOR TO ADMIXING WITH FEED

Robert W. Johnson, Holbrook, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Jun. 1, 1978, Ser. No. 911,624
Int. Cl.[2] F25J *3/00*
U.S. Cl. 62—12 **10 Claims**



1. A cryogenic apparatus, comprising, in combination:
a. a feed stream of cryogenic fluid to be cooled in said apparatus;
b. a make-up stream of cryogenic fluid containing an elevated level of at least one contaminant with respect to said feed stream;
c. mixing means for combining the feed and make-up streams into a combined stream of cryogenic fluid;
d. means for passing said combined stream of cryogenic fluid through a heat exchanger wherein it is cooled to a temperature below the freezing point of said contaminant;
e. adsorber means for reducing the level of said contaminant; and,
f. means for directing said make-up stream through the adsorber means prior to directing it to said mixing means.

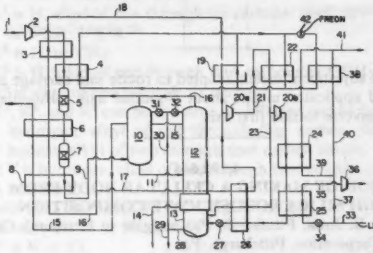
4,192,662

PROCESS FOR LIQUEFYING AND RECTIFYING AIR

Shunji Ogata, Machida, and Yohei Yamamoto, Tokyo, both of Japan, assignors to Japan Oxygen Co., Ltd. and Tokyo Cryogenic Industries Co., Ltd., both of Tokyo, Japan

Filed Dec. 23, 1977, Ser. No. 863,889
Int. Cl.[2] F25J *3/04*
U.S. Cl. 62—13 **6 Claims**

1. In a process for separating air by liquefaction and rectification to produce liquid oxygen and liquid nitrogen as main products, wherein in such processes the cold of liquefied natural gas is used, the improvement comprising the steps of:
(a) compressing feed air to a low pressure at which the air can still be fed into a rectification step;
(b) cooling said feed air in a non-reversing heat exchanger by heat exchange with low-temperature gas which is obtained from separation of said feed air, said low temperature gas being (1) nitrogen or (2) nitrogen and oxygen in separate process lines;
(c) removing water and carbon dioxide impurities contained in said feed air by adsorptive purification;
(d) cooling said purified feed air by heat exchange with low temperature gas which is obtained from separation of said feed air, said low temperature gas being (1) nitrogen or (2) nitrogen and oxygen in separate process lines;
(e) separating said cooled feed air from step (d) into nitrogen and oxygen at approximately atmospheric pressure by liquefaction and rectification to provide at least liquid oxygen which is removed as a product, said rectification including refluxing and reboiling;
(f) warming a portion of said nitrogen which is obtained in separation step (e) by heat exchange with said feed air;
(g) cooling the said portion of the nitrogen by heat exchange with freon which has been cooled by liquefied natural gas;



(h) compressing said cooled nitrogen to a pressure higher than a pressure required for reboiling at a low temperature in said rectification step (e), the pressure of compressed nitrogen in step (h) being enough to liquefy the nitrogen by heat exchange with the cold of liquefied natural gas transmitted to said compressed nitrogen, and
(i) cooling further said compressed nitrogen by heat exchange with the liquefied natural gas to liquefy the nitrogen;
(j) expanding said compressed and cooled liquid nitrogen until a pressure required for reboiling at low temperature in said rectification step (e) is achieved;
(k) circulating said expanded liquid nitrogen which is obtained from step (i) as a heat source for reboiling and withdrawing a portion of said liquid nitrogen as said reflux in step (e) and as a product,
wherein said compressing step (h) is done at the lower inlet temperature to reduce the power of said compression.

4,192,663

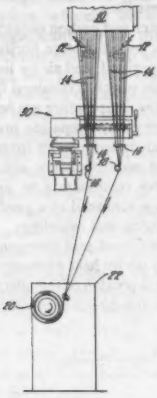
APPARATUS FOR COATING GLASS FIBERS

Gary M. Schmandt, Reynoldsburg, Ohio; Robert N. Chappelear, and Ronnie D. Hand, both of Anderson, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 29, 1978, Ser. No. 937,908
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—11 R **9 Claims**

1. Apparatus adapted to apply a coating to advancing continuous filaments comprising:
a bracket;
a base journaled at said bracket for rotation about a first axis;
means for rotating said base;
applicator means adapted to apply a coating to the advancing filaments;
a carriage joined to said applicator means, the carriage being

adapted for a sliding engagement with said base along a path substantially transverse to said first axis; and



a first adjustment means adapted to rotate said carriage and said applicator means about a second axis substantially transverse to said first axis.

4,192,664

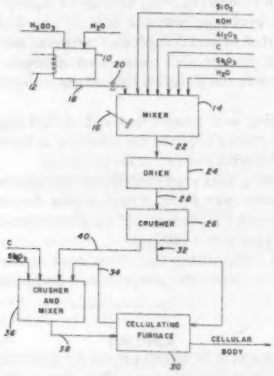
METHOD OF MAKING A CELLULAR BODY FROM A HIGH SILICA BOROSILICATE COMPOSITION

Shridhar B. Joshi, Pittsburgh, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 743,218, Nov. 19, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,610

Int. Cl.[2] C03B *19/08*

U.S. Cl. 65—22 **30 Claims**



1. A method of making a cellular body from a high borosilicate composition comprising,

mixing at a temperature below the melting temperature of any of the constituents amorphous silica having particles of submicron size, alumina, boric acid, less than 3% by weight alkali metal oxide and a cellulating agent and forming a pulverulent homogeneous mixture, said mixture containing more than 80% by weight amorphous silica, and

thereafter subjecting said pulverulent homogeneous mixture to a temperature sufficient to coalesce but insufficient to further homogenize said homogeneous mixture, said temperature being sufficient to gasify said cellulating agent and form a cellular body having a substantially uniform cell structure.

17. A method of making a cellular body from a high borosilicate composition comprising,

comminuting and mixing constituents at a temperature below the melting temperature of any of the constituents comprising alumina, boric acid, alkali metal salt and a cellulating agent to form a first mixture,

adding amorphous silica having particles of submicron size to said first mixture to form a second mixture, said second mixture containing more than 80 percent by weight amorphous silica and less than 3 percent by weight alkali metal oxide, and

thereafter subjecting said second mixture to a temperature sufficient to coalesce said second mixture but insufficient to further homogenize said second mixture, said temperature being sufficient to gasify said cellulating agent and form a cellular body having a substantially uniform cell structure.

4,192,665

RAPIDLY CRYSTALLIZED BETA-SPODUMENE GLASS-CERAMIC MATERIALS

Kenneth Chyung, Painted Post, and John E. Megles, Jr., Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 7, 1977, Ser. No. 848,862

Int. Cl.[2] C03B *32/00*; C03C *3/22*

U.S. Cl. 65—33 **3 Claims**

1. A method for producing a white, opaque, chemically durable, low-expansion glass-ceramic material comprising beta-spodumene solid solution as the principal crystal phase which comprises the steps of:

(a) selecting for crystallization a glass having a composition falling within one of Ranges I and II below, wherein:

Range I includes compositions consisting essentially, in weight percent, of about 63–67% SiO_2, 18–21% Al_2O_3, 3.0–5.0% Li_2O, 1.0–2.5% MgO, 0.4–2.5% ZnO, 4.0–5.0% TiO_2, 1.5–4.0% PbO, 0–1.0% B_2O_3, 0–1.0% Na_2O, 0–2.0% P_2O_5, and 0–2% total of $B_2O_3+Na_2O+P_2O_5$, and

Range II includes compositions consisting essentially, in weight percent, of about 68–71% SiO_2, 16–18% Al_2O_3, 3.0–5.0% Li_2O, 1.0–2.5% MgO, 0.4–2.5% ZnO, 4.0–5.0% TiO_2, 0–1.0% B_2O_3, 0–1.0% Na_2O, 0–2.0% P_2O_5, and 0.2–2.2% total of $B_2O_3+Na_2O+P_2O_5$; and

(b) converting the selected glass to a glass-ceramic material utilizing a crystallization heat treatment comprising heating the glass to a nucleation temperature in the range of about 750°–800° C. for a time in the range of about 1–4 hours to develop crystal nuclei throughout the volume of the glass, followed by heating the glass to a crystallization temperature in the range of about 900°–1000° C. for a time not exceeding about 2 hours, whereby a white, opaque, chemically durable, low-expansion glass-ceramic material comprising beta-spodumene solid solution as the principal crystal phase is provided.

4,192,666

METHOD OF PRODUCING GLASS-CERAMICS WITH UNIFORM BROWN STAIN DECORATION

Vincent Lupoi, Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 14, 1978, Ser. No. 942,254

Int. Cl.[2] C03B *32/00*; C03C *17/00*

U.S. Cl. 65—33 **8 Claims**

1. A method for producing uniformly colored brown stain decorations in glass-ceramic articles which include inhomogeneities which affect stain coloration, comprising the steps of:

forming a glassy article from a crystallizable glass composition comprising SiO_2, Al_2O_3, Li_2O, ZnO, and as a crystal

growth nucleating agent, either TiO_2 or a mixture of TiO_2 and ZrO_2;

heating said glassy article to a temperature at which a major portion of the article crystallizes within a glassy matrix, thereby forming a glass-ceramic;

applying a palladium-containing stain-decorating composition onto the surface of the crystallized glass-ceramic article; and

heating the crystallized glass-ceramic article with the stain-decorating composition thereon so as to migrate palladium ions from the composition into surface portions of the article, thereby producing a uniformly colored, brown stained pattern in the surface of the article.

2. A method for producing brown colored stain decorations in glass-ceramic articles comprising the steps of:

forming a glassy article from a crystallizable glass composition comprising SiO_2, Al_2O_3, Li_2O, ZnO, and as a crystal growth nucleating agent, either TiO_2 or a mixture of TiO_2 and ZrO_2;

heating said glassy article to a temperature at which a major portion of the article crystallizes within a glassy matrix, thereby forming a glass-ceramic;

applying a palladium-containing stain-decorating composition onto the surface of the crystallized glass-ceramic article; and

heating the crystallized glass-ceramic article with the decorating composition thereon so as to migrate palladium ions from the composition into surface portions of the article, thereby producing a uniformly colored, brown stained pattern in the surface of the article.

4,192,667

PLATINUM GROUP METAL LAYER ON A REFRACTORY

Max G. Chrisman, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 862,996, Dec. 21, 1977. This application Oct. 23, 1978, Ser. No. 954,045

Int. Cl.[2] C03B *37/00*

U.S. Cl. 65—374 RM **2 Claims**

1. In an apparatus having a glass contacting member comprising a refractory substrate, a platinum group metal sheet and means bonding said sheet to said substrate, the improvement wherein said means is an alloy composition consisting essentially of platinum and rhodium.

4,192,668

DESICCANT AND DEFOLIATING SPRAY COMPOSITION FOR LEGUMINOUS PLANTS

Clarence A. L. Phillips, Pointe-a-Pierre, Trinidad and Tobago, and Henry W. Archer, New York, N.Y., assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad and Tobago and Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 835,388, Sep. 21, 1977, abandoned. This application Oct. 18, 1978, Ser. No. 952,415

Int. Cl.[2] A01N *9/04*

U.S. Cl. 71—70 **4 Claims**

1. A process for defoliating and/or desiccating the foliage of leguminous plants which consists essentially in applying to said foliage from 56 to 560 liters per hectare of a composition comprising at least one mineral oil having a viscosity range at 100° F. of between about 34 and 110 SUS, an aromatic content of between 18 and 55 percent; a boiling range of about 180° C. with initial boiling temperatures of between 180° and 420° C.; and a surface tension of between 24 and 28 dines per centimeter at 30° C.; a Harkins Spreading Coefficient for one minute of between 19 and 28 and for 30 minutes of between about 17 and 31 a maximum unsulfonated residue of 85 percent.

4,192,669

HERBICIDAL ETHERS

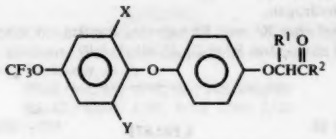
John B. Adams, Jr., Hockessin, and Joel B. Wommack, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1977, Ser. No. 863,268

Int. Cl.[2] A01N *9/24*; **C07C** *65/02, 69/76*

U.S. Cl. 71—108 **27 Claims**

1. A compound of the formula



wherein

R^1 is H, CH_3 or CH_3CH_2;

R^2 is OR^3, NR^4R^5, or SR^6;

R^3 is H, alkyl of one through six carbons, $Na^{\oplus}$, $K^{\oplus}$, Ca^{+2} or $^{\oplus}NR^7R^8R^9R^{10}$;

R^4 is H, or CH_3;

R^5 is H, alkyl of one through four carbons or OCH_3;

R^6 is alkyl of one through six carbons;

R^7, R^8, and R^9 can be the same or different and each can be hydrogen, alkyl of one through four carbon atoms or hydroxyalkyl of two through four carbon atoms;

R^{10} is hydrogen, alkyl of one through twelve carbon atoms or benzyl;

provided that when R^5 is OCH_3, R^4 is CH_3;

X is H, Cl, Br or NO_2; and

Y is H or Cl;

provided that when Y is Cl, X must be H or Cl.

19. A method for control of weeds which comprises applying to a locus to be protected an effective herbicidal amount of a compound of claim 1.

4,192,670

ACETAL DERIVATIVES OF 4-(SUBSTITUTED AMINO)-3,5-DINITROBENZALDEHYDES

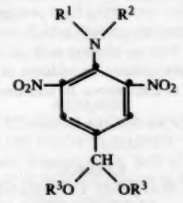
Quentin F. Soper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 707,416, Jul. 21, 1976, Pat. No. 4,054,439, which is a division of Ser. No. 557,866, Mar. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,674, Oct. 15, 1974, abandoned. This application Aug. 3, 1977, Ser. No. 821,280

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—121 **9 Claims**

1. A compound of the formula



wherein

R^1 represents

(A) C_1–C_6 alkyl, optionally monosubstituted with

(1) methoxy,

(2) halo,

(B) C_3–C_4 alkenyl,

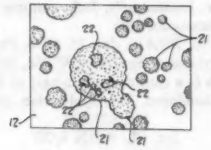
(C) halo(C_3–C_4)alkenyl,

(D) C_3–C_4 alkynyl, or
(E) cyclopropylmethyl;
R^2 represents
(A) C_1–C_6 alkyl, optionally monosubstituted with
(1) methoxy,
(2) halo,
(B) C_3–C_4 alkenyl,
(C) halo(C_3–C_4)alkenyl,
(D) C_3–C_4 alkynyl, or
(E) cyclopropylmethyl;
(F) hydrogen;
provided that R^1 and R^2 together contain no more than 8 carbon atoms; and R^3 is C_1–C_3 alkyl.

4,192,671
PLANT GROWTH REGULATORS
Eberhard P. Schott, Neustadt, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Sep. 8, 1978, Ser. No. 940,474
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741343
Int. Cl.² A01N *9/20*
U.S. Cl. 71—121 **1 Claim**

1. A process for improving the abscission of citrus fruits which comprises applying to trees bearing such fruit an effective amount of an N,N-dimethyl-N-C_{12}–C_{14}-alkyl-N-benzylammonium salt or an N,N-dimethyl-N,N-dibenzylammonium salt.

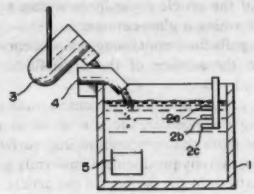
4,192,672
SPRAY-AND-FUSE SELF-FLUXING ALLOY POWDERS
Larry N. Moskowitz, Warrensville Heights, and Erhard Klar, Beachwood, both of Ohio, assignors to SCM Corporation, Cleveland, Ohio
Filed Jan. 18, 1978, Ser. No. 870,339
Int. Cl.² B22D *23/08*
U.S. Cl. 75—0.5 C **10 Claims**



1. A boron-containing nickel or cobalt spray-and-fuse, self-fluxing alloy powder containing hard precipitates of chromium boride and/or chromium carbide which precipitates are internally precipitated from a viscous melt of said alloy, at least about 5% of said precipitates by volume of said powder have an average size of at least about 10 microns.

4,192,673
METHOD OF MANUFACTURING GRANULATED FERRONICKEL
Kohzo Baba, Hyuga, and Itsuyoshi Nagatomo, Miyazaki, both of Japan, assignors to Hyuga Smelting Co., Ltd., Hyuga, Japan
Filed Dec. 19, 1978, Ser. No. 970,956
Int. Cl.² B22D *23/08*
U.S. Cl. 75—0.5 C **8 Claims**

1. A method of manufacturing granular ferronickel from fused ferronickel containing no less than 0.1% by weight of carbon by deoxidizing said fused ferronickel with addition of a



deoxidizing agent and then water granulating the resultant mixture.

4,192,674
METHOD OF OBTAINING TANTALUM-NIOBIUM FROM ORES HAVING A HIGH TITANIUM CONTENT
Bruno Krismer, Goslar, and Harmut Pungs, Laufenburg, both of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany
Filed Jul. 18, 1978, Ser. No. 925,834
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733193
Int. Cl.² C22B *4/00*; C21B *15/02*; C22B *9/10*
U.S. Cl. 75—10 R **12 Claims**

1. A process for reducing an ore having a substantial content of tantalum, niobium and titanium oxides and being substantially free of tin and iron oxides to obtain a metal having a substantial tantalum and niobium content, said process comprising the steps of:
melting said ore in the presence of calcium oxide, heavy spar and metallic aluminum in an electric arc furnace, the weight of said aluminum being between about 1.5 and 3.0 times the equivalent weight of aluminum theoretically required for the stoichiometric reducton of the total tantalum and niobium in the ore, the weight ratio of said calcium oxide to said aluminum being between about 0.3 and 0.5, and the weight ratio of said heavy spar to said aluminum being between about 0.1 and 0.8, the weight ratio of said heavy spar to said calcium oxide being selected to effectively prevent the formation of calcium-aluminum titanates, to form a metal fraction rich in tantalum and niobium and lean in titanium relative to said ore, and a slag fraction; and
separating said metal fraction from said slag fraction.

4,192,675
PROCESS FOR DECARBURIZING FERRO-MANGANESE
Robert A. Featherstone, Northcliff; Paul P. Roos, Florida; Willem A. Gericke, Meyerton, all of South Africa; Jean Saleil, Saint-Etienne, France; Pierre J. Leroy, Saint-Germain-en-Laye, France, and Jean-Marcel Masson, Saint-Etienne, France, assignors to S.A. Manganese Amcor Ltd., Johannesburg, South Africa and Creusot-Loire, Paris, France
Filed Dec. 28, 1978, Ser. No. 974,507
Claims priority, application France, Jan. 17, 1978, 78 01171
Int. Cl.² C21C *5/34*
U.S. Cl. 75—60 **14 Claims**

1. A process for decarburizing a ferro-manganese melt by blowing an oxidizing gas into the melt through at least one immersed tuyere protected with a peripheral fluid introduced into the outer tube of said tuyere, and then into said melt, which comprises the successive steps of
(a) blowing an oxidizing gas consisting of pure oxygen through an inner tube of said tuyere to reduce the carbon content from an initial value, C_1, of from 6% to 7.5% to a second value, C_2, of from 2% to 3.5% and to raise the melt to a temperature of from 1650° to 1750° C., and

(b) blowing an oxidizing gas consisting of 0 to 50% of oxygen, at least 30% of steam, and 0 to 70% of an inert gas, all by volume through an inner tube of said tuyere to reduce the carbon content from the second value, C_2, to a third value, C_3, which is at most 1.6% and to maintain the temperature of the melt at from 1670° C. to 1710° C.

4,192,676

HIGH TEMPERATURE REDUCTION OF COPPER SALTS

James E. Reynolds, Golden; Wayne C. Hazen, Denver, and Duane N. Goens, Golden, all of Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed May 11, 1978, Ser. No. 905,091
Int. Cl.² C22B 15/00
U.S. Cl. 75—72 **30 Claims**

1. A process for reducing copper bearing materials selected from the group consisting of copper chlorides and copper oxychlorides to elemental copper with hydrogen which comprises:

injecting the copper bearing materials into a reactor in finely divided solid form;

maintaining the reactor temperature in excess of 1083° C.;

contacting the copper bearing materials with hydrogen under conditions which require intimate contact and a substantially instantaneous reduction reaction in order to produce liquid elemental copper.

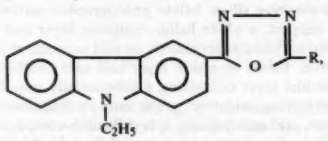
4,192,677

1,3,4-OXADIAZOLE DERIVATIVES AND USE THEREOF

Mitsuo Okazaki, Tama; Akihiro Yamaguchi, Yokohama, and Masaomi Sasaki, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 796,221, May 12, 1977, Pat. No. 4,141,729. This application Nov. 6, 1978, Ser. No. 958,190
Claims priority, application Japan, May 18, 1976, 51-56830; May 18, 1976, 51-56832
Int. Cl.² G03G 5/06
U.S. Cl. 430—77 **28 Claims**

1. An electrophotographic plate comprising an electrically conductive support and a photoconductive layer overlying said electrically conductive support, said photoconductive layer consisting essentially of a mixture of a charge-generating pigment, a compound having the formula



wherein R is selected from the group consisting of phenyl, halogenophenyl, nitrophenyl, alkylphenyl wherein alkyl has 1 to 4 carbon atoms, alkoxyphenyl wherein alkoxy has 1 to 4 carbon atoms, cyanophenyl, carboxylic ester substituted phenyl, dialkylaminophenyl wherein alkyl has 1 to 4 carbon atoms, naphthyl, anthryl and a binding agent.

4,192,678

N-ALKYL- OR N-ARYL-BENZISOXAZOLONE SCAVENGER COMPOUNDS

Richard A. Chasman, Hilton, and Wayne F. Erickson, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 15, 1978, Ser. No. 960,888
Int. Cl.² G03C 1/40, 5/54, 7/00, 1/06
U.S. Cl. 430—214 **42 Claims**

15. In a photographic assemblage to be processed by an alkaline processing composition, said assemblage comprising:

(a) a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a negative-working, dye image-providing material which produces an imagewise distribution of diffusible dye in the areas where said silver halide is developed; and

(b) a dye image-receiving layer;

the improvement wherein said photographic assemblage contains an N-alkyl- or N-aryl-benzisoxazolone compound.

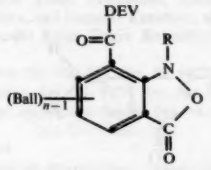
4,192,679

BIFUNCTIONAL BENZISOXAZOLONE COMPOUNDS

Wayne F. Erickson, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 15, 1978, Ser. No. 960,889
Int. Cl.² G03C 1/40, 5/54, 7/00, 1/10
U.S. Cl. 430—214 **48 Claims**

37. A process for producing a photographic image in color in an imagewise-exposed photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a negative-working, dye image-providing material which produces an imagewise distribution of diffusible dye in the areas where said silver halide is developed, said element containing a compound having the following formula:



wherein:

R represents a substituted or unsubstituted alkyl or aryl group;

DEV is a silver halide developing agent;

Ball is at least one organic ballasting radical of such molecular size and configuration as to render said compound nondiffusible in said photographic element during development in an alkaline processing composition; and

n is a positive integer of 1 to 4;

said process comprising:

treating said element with an alkaline processing composition to cause the benzisoxazolone ring to open and release the silver halide developing agent by nucleophilic displacement, said developing agent then effecting development of each exposed silver halide emulsion layer, whereby:

(a) an imagewise distribution of said dye is formed as a function of said development of said silver halide emulsion layer; and

(b) at least a portion of said imagewise distribution of said dye diffuses out of said element.

4,192,680

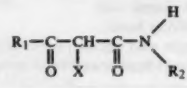
PROCESS FOR TREATING LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Isamu Fushiki; Atushi Kamitakahara, both of Hino, and Keiichi Mori, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 24, 1978, Ser. No. 908,913
Claims priority, application Japan, May 26, 1977, 52-61917
Int. Cl.² G03C 7/00
U.S. Cl. 430—380 **11 Claims**

1. A process for developing an image-wise exposed light-sensitive silver halide color photographic material with a color developing solution which process comprises conducting the development with the developing solution containing 0.0534 to

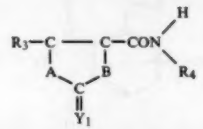
3.0 mol/l of bromide ion in the presence of a yellow coupler represented by general formula [I], [II], [III]or [IV];



(I)

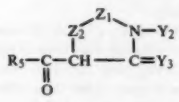
wherein R_1 represents a chained or cyclic alkyl group having at the end thereof a tertiary carbon atom which is directly attached to the carbonyl group, or an aryl group, X represents

or a group on which oxygen is directly attached to the active point, said group being able to split off during coupling and said oxygen being directly attached to a non-metal atom having a double bond, A_1 represents and atomic group necessary for forming an imido group, a pyrrole group or a diazole group, and R_2 represents an aryl group or a heterocyclic ring;



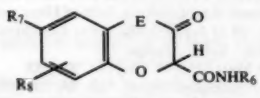
(II)

wherein R_3 represents a chained or cyclic alkyl group, an aryl group or a heterocyclic ring, A and B each represent oxygen or >N—R'(wherein R' represents hydrogen, an alkyl group, an aryl group, or an acyl group), Y_1 represents oxygen or sulfur and R_4 represents an aryl group or a heterocyclic ring, provided that there are excluded the case where A and B are the same;



(III)

wherein R_5 represents a chained or cyclic alkyl group, an aryl group or a heterocyclic ring, Y_2 represents hydrogen or R_3; when Z_1 represents a carbonyl group or a thiocarbonyl group, Y_3 and Z_2 each represent oxygen or sulfur; and when A_1 represents a chained or cyclic alkylene group, an arylene group or a divalent heterocyclic ring, Y_3 represents oxygen and Z_2 represents oxygen, sulfur, or nitrogen substituted by an acyl group or a sulfonyl group;



(IV)

wherein R_6 represents an aryl group, R_7 represents a group which is not split off during coupling, R_8 represents hydrogen, halogen, an alkyl group, an alkoxy group, an aryloxy group or an acylamino group, and E represents a simple bond or $—C(CH_3)_2—$.

4,192,681

PROCESS FOR FORMING AN AMPLIFIED DYE IMAGE

Mitsuto Fujiwhara; Syunji Matsuo; Mikio Kawasaki; Toyoaki Masukawa, and Yutaka Kaneko, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed Oct. 1, 1976, Ser. No. 728,794
Claims priority, application Japan, Oct. 7, 1975, 50/121559
Int. Cl.[2] G03C *5/32, 7/00*
U.S. Cl. 430—373 **6 Claims**

1. An improved process for forming an amplified dye image by:

(a) imagewise exposing a light-sensitive silver halide photographic material comprising a support and thereon at least one silver halide emulsion layer containing a silver halide and a coupler and further provided with a hydrophilic colloid intermediate layer adjacent to the silver halide emulsion layer,

(b) developing the exposed material with a developer containing a color developing agent, and

(c) processing the developed material with an amplifying solution in the presence of an imagewise-distributed metallic silver in the silver halide emulsion layer which acts as a catalyst and developing agent, the improvement of which comprises:

(1) the coupler being present stoichiometrically in excess of at least 50% relative to the amount of the silver halide,

(2) the ratio in dry thickness of each hydrophilic colloid intermediate layer to the silver halide emulsion layer adjacent thereto in the photographic material being 1 to 10, and

(3) the amplifying solution containing hydrogen peroxide.

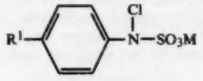
4,192,682

PROCESS OF FORMING A HIGH-CONTRAST SILVER IMAGE

Yoshio Nishina; Syunji Matsuo; Toshio Nagatani; Kazuo Takahashi, and Takeshi Habu, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1978, Ser. No. 869,630
Claims priority, application Japan, Jan. 26, 1977, 52-7459
Int. Cl.[2] G03C *5/30*
U.S. Cl. 430—405 **8 Claims**

1. A process of forming a high-contrast silver image by use of a light-sensitive silver halide photographic material comprising a support, a silver halide emulsion layer and another hydrophilic colloidal layer coated on said support, at least one of said silver halide emulsion layer and said another hydrophilic colloidal layer containing a substantially non-diffusible compound having oxidation power on a hydroquinone developing agent, said substantially non-diffusible compound being selected from the group consisting of (i) a N-chloroarylsulfonamide having the general formula



wherein R^1 representa an alkyl group having 6–12 carbon atoms and M represents an alkali metal atom,

(ii) a bipyridinium compound having the formula

$$[B]^{2+}(X^-)_2$$

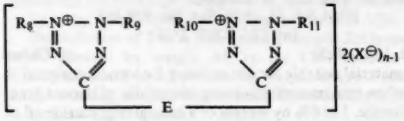
wherein $[B]^{2+}$ represents a bipyridinium compound, and X^- represents an anionix surface active moiety having at least 9 carbon atoms,

(iii) tetraphenylphosphonium bichromate, (iv) tetraphenylphosphonium permanganate, (v) tetraphenylarsonium perchromate and (vi) a quaternary salt, said quaternary

salt being a tetrazolium salt of the following general formulae I, II and III

I

II



III

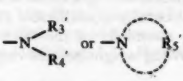
wherein R_1, R_3, R_4, R_5, R_8, R_9, R_{10} and R_{11} each represent an alkyl, allyl, phenyl, naphthyl or heterocyclic group; R_2, R_6 and R_7 each represent an allyl, phenyl, naphthyl, heterocyclic, alkyl or amino group, carboxyl or the salt thereof, mercapto, nitro or hydrogen; D represents an arylene group; E represents an alkylene, allylene or aralkylene group; $X^{\ominus}$ represents an anionic surface active moiety having at least 9 carbon atoms; and n represents an integer of 1 or 2, providing that the compound forms a molecular inner salt when n is 1;

comprising exposing said light-sensitive silver halide photographic material to light;

and developing said exposed photographic material with a developer containing no hydroquinone developing agent, said developer being selected from the group consisting of (A) a compound having the following formula

$$R_1'—Z—R_2'$$

wherein Z is an arylene group; and R_1' and R_2' are individually hydroxyl or an



group in which R_3' and R_4' each represent hydrogen, hydroxyl or an alkyl or aryl group, provided that both of R_1' and R_2' cannot simultaneously be hydroxy when R_1' and R_2' are attached to said arylene group of Z in para-position relation; and R_5' is an atomic group for forming a 5- or 6-membered heterocyclic ring,

(B) sodium ascorbate, and (C) 1-phenyl-3-pyrazolidone.

4,192,683

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

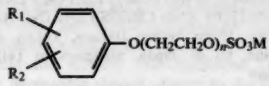
Eiichi Sakamoto; Masao Ishihara; Kazuo Nakazato; Hiroshi Yamada; Sadatugu Terada; Kenichi Kitahara; Naoto Abe; Mamoru Komiya, and Masaru Kanbe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 641,672, Dec. 17, 1975, abandoned. This application Oct. 18, 1977, Ser. No. 843,318

Int. Cl.² G03C *1/76, 1/02*

U.S. Cl. 430—536 **3 Claims**

1. A photographic light-sensitive material comprising a layer which contains a compound represented by the following Formula I



wherein R_1 and R_2 are individually a branched alkyl group having 1 to 18 carbon atoms; M is a cation; and n is a number of 1 to 50.

2. A photographic light-sensitive material comprising a support and a subbing layer formed by applying an aqueous emulsion, which comprises a particulate vinyl polymer and a compound as defined in claim 1, to said support.

4,192,684

PHOTOSENSITIVE COMPOSITIONS CONTAINING HYDROGENATED 1,2-POLYBUTADIENE

Takahashi Gensho; Yanai Masamitsu; Kurihara Masakazu; Tanaka Yoneharu, and Suzuoki Kazuhiro, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 760,211, Jan. 17, 1977, abandoned. This application Apr. 20, 1978, Ser. No. 898,258

Claims priority, application Japan, Jan. 24, 1976, 51/6877

Int. Cl.² G03C *1/68*

U.S. Cl. 430—284 **25 Claims**

1. A photosensitive composition comprising:

(I) 100 parts by weight of one prepolymer having terminal ethylenically unsaturated groups and a number average molecular weight of about 2,000 to 30,000 whose main segment is selected from the group consisting of (i) a chain consisting essentially of a hydrogenated 1,2-polybutadiene having two ends per molecule and a hydrogenation ratio of pendent vinyl groups of the 1,2-addition units of about 50 to 100 percent, about 1.2 to 2 of such ends per molecule carrying hydroxy groups, (ii) a residue consisting essentially of a chain extended hydrogenated 1,2-polybutadiene having 2 to 20 urethane bonds obtained by reaction between the hydrogenated 1,2-polybutadiene and a diisocyanate, (iii) a chain consisting essentially of a hydrogenated 1,2-polybutadiene having two ends per molecule and carboxyl groups at such ends introduced by esterification between the hydroxy groups of the hydrogenated 1,2-polybutadiene and the carboxyl groups of a dicarboxylic acid and (iv) a chain consisting essentially of a chain extended hydrogenated 1,2-polybutadiene having two ends per molecule and carboxyl groups at such ends introduced by esterification between the hydroxy groups of a chain extended hydrogenated 1,2-polybutadiene having hydroxy groups at such ends and 2 to 20 urethane bonds having been prepared by reaction between the hydrogenated 1,2-polybutadiene and the diisocyanate, and the carboxyl groups of a dicarboxylic acid,

(II) about 5 to 100 parts by weight of at least one polymerizable ethylenically unsaturated monomeric compound,

(III) a photopolymerization initiator in an amount of about 0.001 to 10 weight percent of the total weight of the prepolymer (I) and the polymerizable ethylenically unsaturated monomeric compound (II), and

(IV) a stabilizer in an amount of about 0.001 to 2.0 weight percent of the total weight of the prepolymer (I) and the polymerizable ethylenically unsaturated monomeric compound (II).

4,192,685

PHOTOCURABLE UNSATURATED POLYESTER RESIN COMPOSITION AND CROSS-LINKING AGENTS

Akihiro Horike, Hino; Yoshio Itakura, Tokyo, and Tadashi Shingu, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 673,809, Apr. 5, 1976, abandoned, which is a continuation of Ser. No. 482,552, Jun. 24, 1974, abandoned. This application Feb. 1, 1978, Ser. No. 874,134

Claims priority, application Japan, Jun. 28, 1973, 48-72214; Jul. 2, 1973, 48-73596

Int. Cl.[2] G03C 1/68

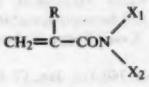
U.S. Cl. 430—283 14 Claims

1. In photosensitive resin composition consisting essentially of: an unsaturated polyester having an acid value of at least 20 and present in from 0.01 to 10% by weight based on the weight of the entire composition; a cross-linking agent; and a photosensitizer; the improvement comprising:

a cross-linking agent present in from 5 to 70% by weight based on the weight of the entire composition and consisting essentially of the combination of

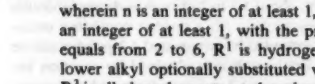
(1) a polyacrylate or polymethacrylate compound,

(2) an acrylamide or methacrylamide compound present in from 1 to 20% by weight based on the weight of the entire composition of the formula



wherein R is hydrogen or alkyl and X_1 and X_2 are organic groups, and

(3) a compound present in from 0.5 to 40% by weight based on the weight of the entire composition and not more than 80% by weight based on the total weight of the cross-linking agent of the formula



wherein n is an integer of at least 1, p, q, and r are 0 or an integer of at least 1, with the proviso that p+q+r equals from 2 to 6, R^1 is hydrogen or methyl, R^2 is lower alkyl optionally substituted with a halogen, and R^3 is alkyl, aryl or saturated acyl optionally substituted with a halogen.

4,192,686

COMPOSITIONS AND METHOD FOR INHIBITING FORMATION OF EXPLOSIVE COMPOUNDS AND CONDITIONS IN SILVERING CONCENTRATES FOR ELECTROLESS DEPOSITION OF SILVER

Joseph F. Soltys, London, Canada, assignor to London Laboratories Limited Co., Woodbridge, Conn.

Filed Oct. 11, 1977, Ser. No. 840,840

Int. Cl.[2] C23C 3/02

U.S. Cl. 106—1.23 31 Claims

1. An improved method for inhibiting formation of explosive conditions or compounds in a mixture resulting from contact of (1) a concentrated aqueous solution of an ammonical silver salt and (2) a concentrated aqueous solution of a strong alkali, which comprises providing an effective amount of an explosion inhibitor comprising a polyhydric alcohol having 4 to 6 carbon atoms in at least one of said concentrated aqueous solutions (1) or (2).

13. An improved multi-part system capable of effecting electroless deposition of silver by simultaneous admixture of diluted portions thereof on a work surface and protected against formation of explosive compounds or conditions in a mixture resulting from contacting the system parts, said system comprising the following parts:

(A) a concentrated aqueous silvering solution comprising ammonical silver salt, an effective amount of explosion inhibitor comprising a polyhydric alcohol having 4 to 6 carbon atoms and sufficient extraneous ammonium ions to stabilize said polyhydric alcohol in said aqueous silvering solution and thereby prevent deterioration of the same, and

(B) a concentrated aqueous solution of strong alkali.

4,192,687

LINING MATERIALS

Werner Bade, Bendorf; Günther Gelsdorf, Nordenstadt, and Günther Wieland, Wiesbaden, all of Fed. Rep. of Germany, assignors to Didier-Werke AG and Mannesmann AG, both of Wiesbaden, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,815

Int. Cl.[2] B28B 7/36

U.S. Cl. 106—38.24 10 Claims

1. A material suitable for use as lining for vessels designed to hold molten iron or steel consisting essentially of burned granular dolomite, 1 to 6% by weight of a natural triglyceride oil or a mixture of triglyceride oils and 2 to 6% by weight of dry inorganic particulate binding agents.

4,192,688

PRODUCT AND PROCESS FOR FORMING SAME

Clarence L. Babcock, Toledo; Robert A. Busdiecker, Woodville, and Erwin C. Hagedorn, Oregon, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 533,575, Dec. 17, 1974, abandoned, which is a continuation of Ser. No. 269,667, Jul. 7, 1972, abandoned, which is a division of Ser. No. 70,500, Sep. 8, 1970, Pat. No. 3,788,865, which is a continuation of Ser. No. 464,147, Jun. 15, 1965, abandoned, which is a continuation-in-part of Ser. No. 386,693, Jul. 31, 1964, abandoned. This application Feb. 6, 1975, Ser. No. 547,690

Int. Cl.[2] C03C 3/22, 3/04, 3/20

U.S. Cl. 106—39.7 4 Claims

1. A shaped, non-porous, low-expansion at least partially crystalline light blue ceramic article containing a multitude of substantially homogeneously dispersed crystals dispersed in a glassy matrix, said ceramic article having been formed from a preformed amber glass article by thermal in situ crystallization, said glass being a thermally crystallizable glass having a composition consisting essentially of the following components, present in the following weight percent ranges:

Component	Weight Percent
SiO_2	50–75
Al_2O_3	16–35
Li_2O	3–5.5
B_2O_3	0–9
ZrO_2	0–5
TiO_2	0–10
SnO_2	0–5
P_2O_5	0–3
F_2	0–0.2
Alkaline earth oxide	0–4.5
ZnO	0–4
Na_2O	0–2
CoO and NiO	0.005–2
(ZrO_2 + TiO_2 + SnO_2)	not over 10
(SiO_2 + Al_2O_3)	75–92

the total of TiO_2, ZrO_2 and SnO being from 2–10%, where the glass and the resulting ceramic contains 94–100 percent of the foregoing components, the other 6 to zero percent being other compatible inorganic components, said article having a coefficient of lineal thermal expansion of less than 15×10^{-7}°C. (0°–300° C.).

4,192,689

ION EXCHANGE STRENGTHENING OF SODA-LIME-SILICA GLASS

Dale W. Rinehart, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 30, 1978, Ser. No. 910,705

Int. Cl.[2] C03C *3/04, 21/00*

U.S. Cl. 106—52 **6 Claims**

1. In a glass composition of the conventional soda-lime-silica flat glass type which consists of SiO_2 as the major constituent, 12 to 16 percent by weight Na_2O, 0 to 2 percent by weight K_2O, but no more than 17 percent by weight total of Na_2O and K_2O, a substantial inclusion of CaO, optionally a relatively small amount of Al_2O_3, and 0 to 2 percent by weight total of SO_3 and colorants, essentially free of Li_2O, and exhibiting a melting temperature less than about 2850° F. and a working range greater than about 90° F., the improvement comprising:

enhanced ion exchange strengthening below the strain point by virtue of an elevated annealing point above 1030° F. by the inclusion of 2 to 4.5 percent by weight ZrO_2 and 0 to 4.5 percent by weight Al_2O_3; the CaO content being restricted to 6 to 8.5 percent by weight to avoid reducing the working range; whereby the SiO_2 remainder is 67 to 74 percent by weight.

6. In a glass composition of the conventional soda-lime-silica flat glass type which consists of SiO_2 as the major constituent, 12 to 16 percent by weight Na_2O, 0 to 2 percent by weight K_2O, but no more than 17 percent by weight total of Na_2O and K_2O, a substantial inclusion of CaO, 0 to 5 percent by weight MgO, optionally a relatively small amount of Al_2O_3, and 0 to 2 percent by weight total of SO_3 and colorants, essentially free of Li_2O, and exhibiting a melting temperature less than about 2850° F. and a working range greater than about 90° F., the improvement comprising:

enhanced ion exchange strengthening below the strain point by virtue of an elevated annealing point above 1030° F. by the inclusion of 3 to 4.5 percent by weight ZrO_2 and/or Al_2O_3; the CaO content being restricted to 4 to 8.5 weight percent and the total CaO and MgO content being restricted to 6 to 13 percent by weight to avoid reducing the working range; whereby the SiO_2 remainder is 67 to 74 percent by weight.

4,192,690

FIBER-REINFORCED HYDRAULICALLY HARDENABLE SHAPED OBJECTS

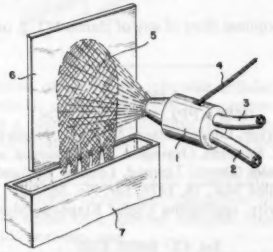
Adolf Meyer, Leimen bein Heidelberg, and Peter O. Gutfleisch, Mannheim, both of Fed. Rep. of Germany, assignors to Portland-Zementwerke Heidelberg A.G., Heidelberg, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,763

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617741

Int. Cl.[2] B28B *21/44, 21/56*

U.S. Cl. 106—99 **13 Claims**



1. Process for the preparation of fiber-reinforced cement-based hydraulically hardenable shaped objects, which comprises spraying cement-based matrix and fibers with a spraying apparatus onto a deflecting surface to produce on said surface a mixture of matrix and fibers, removing the mixture in the unhardened state from said deflecting surface into a mould, and moulding from the mixture fiber-reinforced cement-based hydraulically hardenable shaped objects by hardening under water.

13. Fiber-reinforced cement-based hydraulically hardenable shaped objects prepared by the process of claim 1.

4,192,691

METAL OXIDE PLATELETS AS NACREOUS PIGMENTS

Louis Armanini, Pleasantville, N.Y., assignor to The Mearl Corporation, Ossining, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,928

Int. Cl.[2] C09C *1/00, 1/36*

U.S. Cl. 106—291 **15 Claims**

1. A method for the preparation of a nacreous pigment which comprises the step of subjecting a non-toxic metal oxide coated mica nacreous pigment to an extractive dissolution by contacting said pigment with an aqueous acidic solution comprising hydrofluoric acid together with a mineral acid at an elevated temperature until the desired amount of mica has been removed and the luster has thereby been increased, and recovering the resulting pigment.

4,192,692

PROCESS FOR REMOVING LAYERS OF SELENIUM

Heinz Herrmann, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,561

Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723799

Int. Cl.[2] B08B *3/08*

U.S. Cl. 134—2 **13 Claims**

1. A process for removing a layer, which contains amorphous selenium or consists thereof, from a metal base, which comprises contacting the layer with a first fluid which contains an amine or a mercaptan in an effective amount sufficient to cause flaking-off of said selenium from said metal base, at a temperature in the range between about 60° and 150° C., and then contacting the layer with an inert second fluid at a temperature not exceeding 40° C.

4,192,693

ALUMINUM COPPER ALLOY ELECTRICAL CONDUCTOR AND METHOD

E. Henry Chia, and Roger J. Schoerner, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 724,687, Sep. 20, 1976, which is a continuation-in-part of Ser. No. 685,469, May 12, 1976, which is a continuation-in-part of Ser. No. 505,821, Sep. 13, 1974, abandoned, which is a continuation of Ser. No. 194,757, Nov. 1, 1971, abandoned. This application Aug. 18, 1977, Ser. No. 825,639

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 **7 Claims**

1. A process for preparing a heat resistant aluminum alloy conductor having an electrical conductivity of at least fifty-seven percent (57%) IACS, a percentage elongation of at least 12 percent, and a tensile strength of at least 12,000 psi and containing copper aluminate inclusions having a particle size diameter of less than 10,000 angstrom units when measured along the transverse axis of said inclusions, comprising the steps of:

(a) alloying from about 0.10 to about 1.00 weight percent copper and from about 99.00 to about 99.90 weight percent aluminum; said aluminum consisting essentially of no more than about 0.10 weight percent each of trace elements selected from the group consisting of vanadium, iron, silicon, manganese, magnesium, zinc, boron and

titanium with the total concentration of said trace elements not exceeding about 0.30 weight percent;
(b) casting the alloy into a continous bar in a moving mold formed by a groove in the periphery of a casting wheel and an endless belt lying adjacent to the groove along a portion of the periphery of the wheel;
(c) hot-working the bar substantially immediately after casting while the bar is in substantially that condition as cast by rolling the bar in closed roll passes to obtain a continuous aluminum alloy rod;
(d) drawing the rod with no intermediate anneals to form wire containing the intermetalic precipitate Al_2Cu; and
(e) annealing or partially annealing the wire.

4,192,694
SOLID OR MOLTEN REAGENT TREATMENT OF METAL TIRE CORD

Grover W. Rye, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 644,672, Dec. 29, 1975, abandoned. This application Aug. 4, 1978, Ser. No. 931,231

Int. Cl.[2] B29H *9/10*

U.S. Cl. 148—6.11 **6 Claims**

1. In a process of treating a brass coated steel filament with a reagent reactive with the brass surface or exposed steel surface of the filament so as to promote and/or retain adhesion between a cord comprised thereof any adjacent vulcanized rubber, and/or which improves the resistance of the filament or cord to corrosion, the improvement wherein the filament is either (a) passed through said reagent in its molten form or (b) passed through said reagent in its solid form with the temperature of the wire being above the melting point of the reagent so that the portion of the solid reagent in direct contact with the surface of the filament is in molten form.

4,192,695
METAL CRYSTALS AND PROCESS

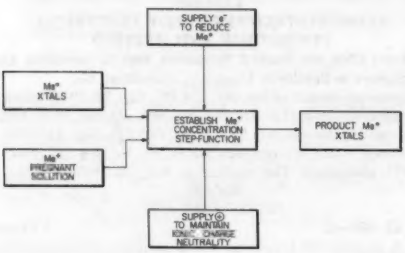
Shalom Mahalla, P.O. Box 11183, Phoenix, Ariz. 85012

Continuation-in-part of Ser. No. 677,690, Apr. 16, 1976, Pat. No. 4,086,082. This application Apr. 24, 1978, Ser. No. 898,799

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] C22B *9/08, 13/00, 25/00, 30/00*

U.S. Cl. 148—32 **7 Claims**


SUPPLY e⁻ TO REDUCE Me⁺
Me⁺ XTALS
ESTABLISH Me⁺ CONCENTRATION STEP-FUNCTION
PRODUCT Me⁺ XTALS
Me⁺ PREGNANT SOLUTION
SUPPLY ⊕ TO MAINTAIN IONIC CHARGE NEUTRALITY

1. As a new article of manufacture, a metal crystal which is
(a) macrocrystalline,
(b) unicrystalline,
(c) columnar,
(d) a single prime particle bounded by at least two sets of distinguishable (hkl) planes specific to said metal which are determined by the internal crystal structure, the crystal orientation being such that another (hkl) plane specific to said metal is perpendicular to the long axis of the crystal, said sets of planes defining a plurality of parallel, non-coplanar, macroscopic facets, which microscopically are crystallographic step-growth surfaces.

7. A process for producing a product metal from a solution of values thereof, comprising:
(a) providing in a crystallization zone
(i) a pregnant solution of values of said product metal, and
(ii) crystals of said product metal;
(b) supplying electrons to said crystals to preferentially reduce product metal ions to product metal in a reduction zone adjacent said crystals;
(c) supplying positive ions in a region of said crystallization zone remote from reduction zone to maintain ionic charge neutrality in said solution;
(d) establishing a concentration step-function of said metal values in said crystallization zone in the locus of said crystals, the gradient thereof being at least sufficient to cause said product metal to attach to the crystal lattice of said crystals by atomic bonding; and
(e) maintaining the concentration step-function of step (d) for a time sufficient to produce a macrocrystalline, unicrystalline, columnar product.

4,192,696
PERMANENT-MAGNET ALLOY

Anton Menth, Nussbaumen; Hartmut Nagel, Wettingen, and Ulrich Spinner, Aeugst, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 746,226, Nov. 3, 1976, Pat. No. 4,131,495. This application May 16, 1978, Ser. No. 906,421

Claims priority, application Switzerland, Dec. 2, 1975, 15631/75

Int. Cl.[2] H01F *1/04, 1/14, 7/02*

U.S. Cl. 148—101 **5 Claims**

1. A permanent magnet alloy selected from the group consisting of

$$RE(Co_{1-u-v-w-x-y}Fe_uMn_vCr_wV_xX_y)_z$$

wherein RE is samarium, cerium, cerium mischmetal (MM), praseodymium, neodymium, lanthanum or mixtures thereof, X is Al, copper or a mixture thereof, and

$0.05 < u < 0.15$
$0.003 < v < 0.15$
$0.003 < w < 0.10$
$0.003 < x < 0.10$
$0.05 < y < 0.20$
$6.5 < z < 8.5$

which has been prepared by the process which comprises homogenization heat-treating the alloy of the molten and cast starting materials at a temperature just above the solidus temperature or in the temperature range in which the non-RE and non-Co components of the alloy have their maximum solubility in the RE_2Co_{17} mixed crystals; crushing and grinding the alloy to particles of a size of from 2 μm to 10 μm of monophase RE_2Co_{17} crystals; magnetically aligning the resultant powder; isostatically compressing the resultant powder; sintering the resultant briquette just below the solidus temperature; and finally annealing the alloy at a temperature between 700° C. and 900° C.

5. The monophase alloy of any of claims **1**, **2**, **3**, or **4** wherein $7.0 < z < 7.5$.

4,192,697
HOT APPLIED COATINGS

William D. Parker, London; Harry M. Smith, North Cheam, and Margaret P. Edwards, Orpington, all of England, assignors to Winn & Coales (Denso) Limited, London, England

Filed Mar. 15, 1978, Ser. No. 886,832

Claims priority, application United Kingdom, Mar. 25, 1977, 12753/77

Int. Cl.[2] B65H *8/00*

U.S. Cl. 156—188 **10 Claims**

1. A method for forming a protective coating on a pipe which method comprises wrapping a hot fabric strip helically over the pipe, the said fabric strip having been previously

impregnated with a hot, molten adhesive, and wrapping a strip of plasticized polyvinyl chloride sheet under tension over the hot fabric wrapping to form a sheathing.

4,192,698

MAKING AN ELECTRODING INK FOR A MONOLITHIC CERAMIC CAPACITOR

John P. Maher, Adams, and Robert T. Jacobsen, Williamstown, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sep. 7, 1977, Ser. No. 831,199
Int. Cl.[2] H01G 1/01
U.S. Cl. 156—89 9 Claims

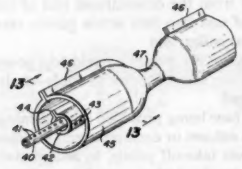
1. A method for preparing a smooth electroding ink for use in making monolithic ceramic capacitors comprising: (a) forming a mixture of a metal powder selected from the group of silver and silver-palladium, milling elements, a surfactant and an organic vehicle, said metal amounting to from 65 to 95 percent of the sum of said metal plus said vehicle by weight; (b) milling said mixture in a non-violent mode, by means of a rotary impeller so as to establish a splash-free laminar flow, until said metal powder exhibits a fineness of grind of less than 8 microns and a surface of a dried sample film of said ink exhibits a peak to peak amplitude of less than 6 microns; (c) removing said milling elements from said milled mixture; and (d) blending into said mixture containing said vehicle an organic binder to obtain a screen printable electroding ink having a viscosity of from 20,000 to 150,000 centipoise.

4,192,699

METHOD OF MAKING INFLATABLE CELLULAR ASSEMBLIES OF PLASTIC MATERIAL

Stephen Lewicki, 7 Forest View Rd., Wallingford, 19086; Gregory D. Lewicki, 47 Springhouse La., Media, 19063, and Stephen J. Lewicki, 7 Forest View Rd., Wallingford, all of Pa. 19086

Division of Ser. No. 778,249, Mar. 16, 1977, Pat. No. 4,076,872. This application Nov. 25, 1977, Ser. No. 854,621
Int. Cl.[2] A45B 19/00; A45C 7/00; B32B 33/00
U.S. Cl. 156—145 4 Claims



1. The method of producing inflatable cellular assemblies from thermoplastic components, which comprises

(a) forming a plurality of collapsible and distendable portions in an outer wear-resistant and gas-impervious component,

(b) sealing an apertured component comprising a thin sheet of plastic material to said first component to permit the entry and egress of a gaseous medium relative to said distendable portions, and

(c) interposing a thin flexible plastic member between said components having apertures offset from those in said apertured component and responsive to the direction of flow of said gaseous medium through said apertured component to exert a valving control thereon and to stop communication therethrough at any desired degree of preponderance in pressure in the interior of said distendable portions relative to that on the exterior thereof.

4,192,700

PROCESS FOR FUSION-BONDING OF RESINS

Kazuyoshi Nagai, 17-6, Kumisawa-Cho, Totsuka-Ku, Yokohama City, Kanagawa Pref., Japan

Filed Apr. 5, 1979, Ser. No. 27,261
Int. Cl.[2] B29C 19/02; B05D 3/06
U.S. Cl. 156—272 3 Claims

1. A process for fusion-bonding of resins, which comprises applying a powdery or filmy thermoplastic resin having a melting point of 40° to 300° C. to a paper and fusion-bonding the resin to the paper by emission energy of a flash discharge lamp comprising a glass bulb filled with a rare gas as the main component, wherein the energy emission density of the flash discharge lamp, which is represented by the following formula:

$$Q=J/((P/4)D^2Lt)$$

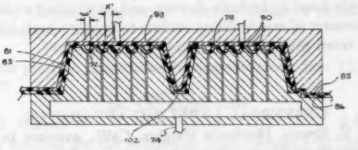
wherein Q stands for the energy emission density (joule/cm^3·msec), J stands for an electric input energy (joule) necessary for irradiation of one sheet of the material to be heated, D stands for the inner diameter (cm) of the bulb of the flash discharge lamp, L stands for the flash discharge passage length (cm), t stands for the pulse width (msec) corresponding to $\frac{1}{3}$ of the peak value of the electric current wave form, and P stands for the circumference ratio, is controlled within a range of $1 \leqq Q \leqq 600$.

4,192,701

DOUBLE WALL PLASTIC ARTICLE AND METHOD AND APPARATUS FOR FORMING A DOUBLE WALL PLASTIC ARTICLE WITH A PAIR OF THERMOPLASTIC SHEETS

Raymond H. Martin, 228 W. Brown, and Larry R. Brushaber, 3437 N. Branch Dr., both of Beaverton, Mich. 48612

Filed Jul. 14, 1977, Ser. No. 815,567
Int. Cl.[2] B29C 17/00
U.S. Cl. 156—285 23 Claims



1. A method of differential pressure forming a double wall, plastic article with a pair of individual deformable thermoplastic foam sheets comprising the steps of:

mounting said individual foam sheets in face to face contiguous relation;

heating said contiguously disposed, individual foam sheets to forming temperature and moving said foam sheets to positions between a pair of mold members, which are relatively movable between spread positions and closed, clamping positions, while maintaining the individuality of

the foam sheets and without bonding the confronting faces of said foam sheets to each other;

then relatively moving said mold members from said spread positions to said closed molding positions to press opposing portions of said heated contiguous foam sheets together and bond said opposing portions to form a perimetrical border of the wall of the article being formed; and

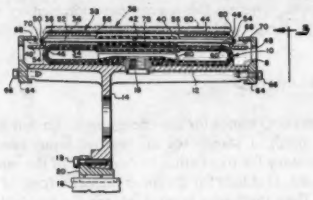
thereafter applying differential forming pressures to a first central portion of at least one of said foam sheets within said border to move said central portion from a position contiguous with an opposing contiguous portion of the other foam sheet to a position removed from said opposing contiguous portion to form a central wall portion of said article.

4,192,702

FLUID EXPANDABLE TIRE BUILDING DRUM WITH SHOE MEANS ATTACHED THERETO TO FORM A TIRE BUILDING SURFACE

Marcus H. Collins, Akron, and John K. Smith, Parma, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 5, 1977, Ser. No. 813,151
Int. Cl.[2] B29H *17/16*
U.S. Cl. 156—416 **14 Claims**



1. A fluid expandable drum for building a tread and a radial tread ply band in a tire building machine comprising an annular support drum having an annular outer surface thereon, an expandable annular tube element having an inner peripheral surface supported on said annular outer surface of said support drum and an outer annular peripheral surface, support means rigidly secured to said outer annular peripheral surface of the tube element for movement therewith, a plurality of shoe means rigidly connected to said support means for movement therewith, said plurality of shoe means cooperating to define an annular building surface thereon which is movable in a radial direction toward and away from said annular support drum upon contraction and expansion, respectively, of said tube element, said tube element being expanded to expand the diameter of said building surface to enable a tread and a radial tread ply band to be built thereon and contracted to decrease the diameter of said building surface to enable a built tread and radial tread ply band to be removed therefrom.

4,192,703

UNIVERSAL LABELING APPARATUS

Frank E. Brown, Hacienda Heights, Calif., assignor to Avery International Corporation, San Marino, Calif.

Filed Jul. 5, 1978, Ser. No. 921,957
Int. Cl.[2] B65C *3/12*
U.S. Cl. 156—443 **27 Claims**

1. A universal labeling system comprising:

a standard base having a cross-section of inverted "T-shaped" configuration; said base including a heavy gauge sheet metal cabinet having a central longitudinally extending raised portion and a heavy metal deck plate mounted on said raised portion;

conveyor belt means for carrying containers to be labeled from an input end to an output end of said conveyor belt means, mounted on said deck plate;

means for applying labels to products moving along said conveyor belt means;

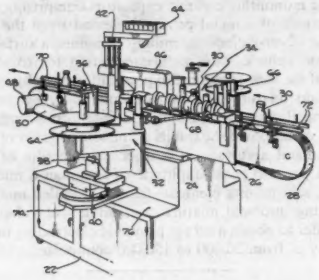
standard mechanical drive system means within said base for providing power to power take-off points for each of the following: (a) said conveyor belt means; (b) a feed screw on one side of the conveyor belt means, (c) a feed screw on the other side of the conveyor belt means, (d) a wrap belt, and (e) top power means for moving an upper product engaging means at the same surface speed as the conveyor belt means and above and spaced from the conveyor belt means;

a hold down belt assembly;

means for selectively connecting said hold-down belt assembly to said top power take-off point to stabilize tall products for label application;

a pair of matched product feed screws;

means for selectively connecting said pair of feed screws to said two power take-off points on one side and on the other side of said conveyor belt means, respectively, and



at the input end of said conveyor belt means; and for driving said feed screws to accelerate products to be labeled onto said conveyor belt means at the speed of said conveyor belt means;

a wrap belt assembly;

means for selectively connecting said wrap belt assembly to said wrap belt power take-off point to rotate a generally circular product and secure a label to its outer surface;

a single feed screw;

means for selectively mounting said single feed screw near the center of said conveyor belt means and for driving said feed screw from the downstream end of said feed screw from one of said two feed screw power take-off points;

a top powered roller; and

means for selectively mounting said top powered roller to said top power take-off point to apply labels to the top of products; and

said standard base being provided with openings, through its heavy duty cabinet or deck plate and associated with each of said power take-off points, to accommodate the transmission of mechanical power from within said base to each of the external associated equipment to be driven.

4,192,704

EXPANDABLE MUFF MOULD

Ingvar Stange, 3880 Dalen, Telemark, Norway

Filed Mar. 27, 1978, Ser. No. 890,217
Claims priority, application Norway, Apr. 18, 1977, 771336
Int. Cl.[2] B65C *1/00*
U.S. Cl. 156—443 **3 Claims**

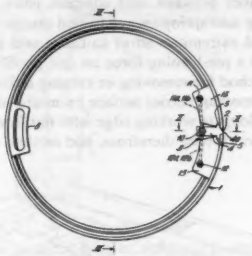
1. In an expandable muff mold for making pipe muff portions, said expandable muff mold including an annular elastic metal member having an axial slot and including a wedge means attached to the inside of said metal member so as to be

movable from a position remote from said slot to a position within said slot, the diameter of said annular elastic metal member increasing when said wedge means is positioned within said slot, the improvement wherein

said wedge means comprises a generally U-shaped member which includes a bottom portion which is positionable within said slot and two leg portions, said two leg portions including axially aligned holes therein,

a first bolt means which extends through said axially aligned holes in said two leg portions of said generally U-shaped member,

two pairs of spaced-apart brackets mounted on the inside of



said annular elastic metal member, each of said pairs of brackets having aligned holes therein,

second and third bolt means respectively mounted to extend through the aligned holes in said pairs of brackets,

first and second link arms mounted on said first bolt means and to said second and third bolt means, respectively, so as to be pivotable with respect thereto, and

a single detachable tool capable of connection with said first bolt means and one of said second and third bolt means such that said first bolt means and thus said wedge means can be moved from a first position remote from said slot to a self-blocking second position in said slot where said wedge means is locked in position.

4,192,705

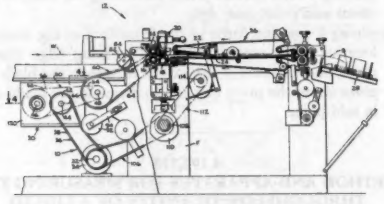
INDEXING ROLL DRIVE SYSTEM

Robert J. Wech, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 15, 1977, Ser. No. 824,938

Int. Cl.[2] B31B *19/60*; B65H *17/22*; F16H *27/04*

U.S. Cl. 156—515 **13 Claims**



12. An indexing role drive system for intermittently moving a web of material through a machine comprising: a pair of draw rolls for engaging the web therebetween; a cam shaft; first and second cams secured to said cam shaft; an output shaft; cam follower carrier means secured to said output shaft; a first group of cam followers on said carrier means for engaging said first cam; a second group of cam followers on said carrier means for engaging said second cam; a drive motor having a driven motor shaft; an input drive train connecting said motor shaft to said cam shaft for continuously driving said input shaft; and an output drive train for providing an uninterrupted connection during operation between said output shaft and one of said draw rolls for intermittently driving said one draw roll and intermittently moving the web a predetermined distance during each cycle; said first and second cams being contoured to begin a cycle of operation constituting one revolution of said input shaft with said output shaft and said one draw roll starting at zero velocity, smoothly accelerating to a maximum velocity and maintaining said maximum velocity in excess of 90° of said cycle and until smoothly decelerating said output shaft and said one draw roll to zero velocity at about 270° of said cycle and to retain zero velocity of the output shaft and said one draw roll during a dwell period to the end of the cycle.

13. A drive system according to claim 12 wherein said machine is a bag machine, and wherein said web is a thermosealing bag forming material.

4,192,706

GAS-ETCHING DEVICE

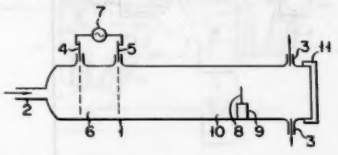
Yasuhiro Horiike, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 647,448, Jan. 8, 1976, Pat. No. 4,123,663. This application Aug. 15, 1978, Ser. No. 933,846

Claims priority, application Japan, Jan. 22, 1975, 50-8642; Mar. 25, 1975, 50-34994; Mar. 28, 1975, 50-36851

Int. Cl.[2] H01L *21/302*; B44C *1/22*; B01K *1/00*

U.S. Cl. 156—643 **14 Claims**



1. A gas etching process comprising:

introducing into a discharge region an oxygen gas and a flurocarbon gas,

producing a long life active species etching gas by applying high frequency power to said gases in the discharge region, and

reacting said etching gas with the material to be etched in a reaction region spaced from the discharge region a distance such that electric fields in the discharge region do not extend to the reaction region.

4,192,707

HEAT TREATMENT OF CHRYSOTILE ASBESTOS FIBRES

Roger W. Glass, Oakville, and Richard A. Kuntze, Mississauga, both of Canada, assignors to Ontario Research Foundation, Mississauga, Canada

Filed Dec. 29, 1977, Ser. No. 865,410

Claims priority, application United Kingdom, Jan. 12, 1977, 1222/77

Int. Cl.[2] D21B *1/02*

U.S. Cl. 162—3 **6 Claims**

1. A method for the formation from Group 4 or Group 5 chrysotile asbestos fibres of long, very straight, smooth-surfaced, hard asbestos fibres having enhanced impact strength in resin reinforcement, which comprises:

initially separating a coarse fraction from said chrysotile asbestos fibres and heat treating said coarse fraction to form said hard asbestos fibres;

said heat treatment being effected by heating in an ambient atmosphere having a substantially uniform temperature of about 400° to about 600° C. for a time from about 1 to about 5 hours sufficient to increase the impact strength of the coarse fraction of fibres in resin reinforcement and

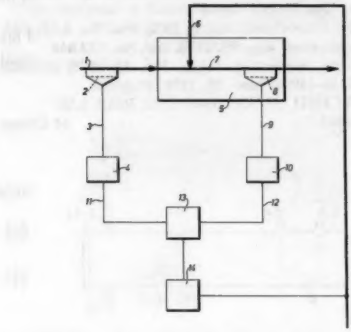
insufficient to result in a loss of water of crystallization of the fibres of greater than about 2% by weight of the total weight of water of crystallization.

4,192,708

METHOD FOR CONTROLLING THE ADDITION OF ACTIVE CHEMICAL FOR DELIGNIFYING AND/OR BLEACHING CELLULOSE PULP SUSPENDED IN A LIQUOR CONTAINING CHEMICALS REACTIVE WITH THE DELIGNIFYING AND/OR BLEACHING CHEMICAL

John R. Bergstrom; Bengt G. Hultman, both of Domsjoverken, and Astrid T. P. Dalborg, Bonassund, all of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation of Ser. No. 608,310, Aug. 27, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 767,174
Claims priority, application Sweden, Sep. 5, 1974, 7411247
Int. Cl.[2] D21C *9/10*; G01N *31/16, 33/00*
U.S. Cl. 162—49 34 Claims



1. A process for controlling the addition of delignifying chemical for delignifying cellulose pulp suspended in an aqueous liquor containing spent chemical other than the cellulose pulp that is reactive with such delignifying chemical, which comprises determining firstly prior to the addition of delignifying chemical the amount of delignifying chemical consumed by the chemical reactive with the delignifying chemical in the liquor in the absence of the cellulose pulp; adding a known amount of the delignifying chemical to the cellulose pulp suspension, and then, during the delignification after a predetermined time interval following addition of the delignifying chemical to the cellulose pulp suspension, determining secondly in the absence of cellulose pulp fibers the residual amount of delignifying chemical in the liquor; from these first and second determinations and the known amount of delignifying chemical determining the amount of delignifying chemical consumed by the pulp; and then adding an amount of delignifying chemical adjusted according to the amount of delignifying chemical consumed by the pulp, and carrying out the delignification.

4,192,709

CREPING DOCTOR

Harold E. Dunlap, Auburn, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 762,308, Jan. 25, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,755
Int. Cl.[2] D21G *3/02, 3/04*
U.S. Cl. 162—111 22 Claims

10. A bladeholder apparatus for creping a web of paper or the like on a surface of a roll rotating to move said surface in a prescribed direction, comprising:

a doctor back providing a reference platform;

a plurality of pressure finger means arrayed side-by-side on said back, each finger being rotatably mounted at one end to said back in a common axis;

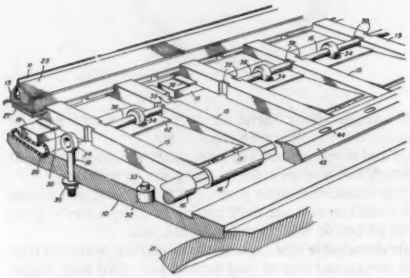
a pad attached to each pressure finger means at its other end and confronting said reference platform;

resilient profiling means positioned on said doctor back between said reference platform and all of said pads;

bladeholder means mounted on said pressure finger means at said other end of each on the sides thereof opposite said pads;

spring means disposed between adjacent pairs of said pressure finger means, each said spring means being supported at one extremity by said pads and at the other extremity by a member between said adjacent pairs; and means for holding said spring means to said doctor back intermediate said extremities so as to cause said spring means to present a pre-loading force on said profiling means.

22. A method for removing or creping a thin sheet of material from a moving carrier surface by means of a doctor blade having an elongate working edge with flat front and rear faces extending width-wise therefrom, said method comprising:



supporting the blade transversely to the direction of movement of the carrier surface and applying the blade to the carrier surface so that its working edge is in frictional engagement with the carrier surface;

maintaining the blade so that it lies substantially along a plane which is generally normal to the direction of movement of the carrier surface, thereby to present a region of the front face adjacent to the working edge to the continually advancing sheet;

supporting the blade by engagement with its rear face along a longitudinally extending pivot line to resist the frictional force imparted to the blade at the working edge by the moving carrier surface while permitting the blade to pivot about said pivot line; and,

applying a reaction force to the front face of the blade at a location more remote from the working edge than the pivot line, to control the extent to which the blade may pivot about the pivot line and to maintain the blade stably in said plane.

4,192,710

METHOD AND APPARATUS FOR MEASURING THE THROUGHFLOW QUANTITY OF A LIQUID SUBSTANCE PER UNIT OF TIME IN A PAPERMAKING MACHINE

Alfred Bubik, Ravensburg; Rainer Jox, Weingarten, and Hans-Joachim Schultz, Ravensburg-Oberhofen, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

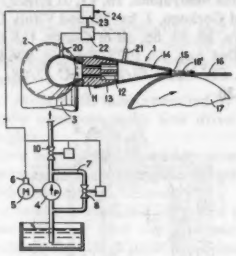
Filed Oct. 5, 1978, Ser. No. 948,689
Claims priority, application Switzerland, Oct. 20, 1977, 12786/77
Int. Cl.[2] D21F *1/06*; F16L *55/04*
U.S. Cl. 162—198 9 Claims

1. A method for measuring the throughflow quantity of a

liquid substance in the form of a fibrous suspension per unit of time in papermaking machine, comprising the steps of:

providing a throttle element in the form of a performed plate having a number of essentially parallel channels through which flows the liquid substance therethrough with only a fine turbulence;

infeeding the liquid substance to said perforated plate for throughflow in a predetermined direction of flow through said essentially parallel channels; and



measuring the pressure drop at the throttle element essentially directly upstream and downstream of the throttle element with respect to the direction of flow of the liquid substance and wherein during the measurement of the pressure drop there does not occur any pressure fluctuations which adversely affect the measurement.

2. The method as defined in claim 1, further including the steps of:

utilizing a perforated plate as the throttle element whose friction has negligible effect on the measurement of the pressure drop.

4,192,711

PAPER-MANUFACTURING METHOD AND APPARATUS FOR CONVEYING A WEB FROM A FORMING WIRE TO A DRYING SECTION

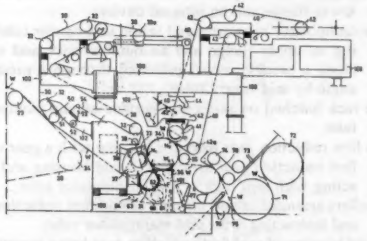
Olli Tapio; Lassi Veijonen, and Eero Hannonen, all of Jyväskylä, Finland, assignors to Valmetoy, Finland

Filed Nov. 21, 1977, Ser. No. 853,538

Claims priority, application Finland, Nov. 30, 1976, 763434

Int. Cl.[2] D21F *3/02, 3/04*

U.S. Cl. 162—199 **17 Claims**



1. A method in a paper making machine for detaching a paper web from a forming wire and conducting the web over a closed draw to the press section of the machine such that the web only laps non-suction rolls and for carrying out a dewatering pressing operation, comprising the steps of:

transferring the web from a forming wire onto a felt;

conducting the web carrying felt over a substantial sector of a non-suction guide roll prior to passing the web carrying felt through the first press nip in the press section of the machine defined by a first press roll and a smooth surface roll;

simultaneously directing a steam treatment onto the portion of the web which laps said non-suction guide roll such that the web is heated, said steam treatment acting to support said web on said felt; and

directing said web carrying felt from said non-suction guide roll through the first press nip of the press section.

7. In a method as recited in claim 1 and including the step of engaging the smooth-surfaced roll with a doctor blade at a location where the surface of the smooth-surfaced roll is exposed, and guiding waste away from said smooth-surfaced roll after the waste has been separated therefrom by the doctor blade.

4,192,712

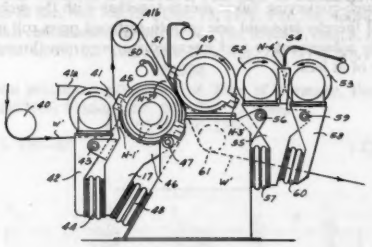
COMBINED BREAKER SIZE PRESS COATER

George L. Dreher, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 13, 1977, Ser. No. 860,208

Int. Cl.[2] B05C *1/12, 3/132, 5/02*

U.S. Cl. 162—265 **9 Claims**



1. In a paper web processing machine, the combination comprising:

means for supplying a continuous traveling paper web;

a breaker press having a breaker nip formed between a first roll and a second roll,

said first and second rolls having smooth metal surfaces for performing a breaker press operation for smoothing and laying down the fibers on the web;

means for controlling the nip pressure between said rolls;

a third roll forming a coating nip with said second roll with said web passing through said coating nip immediately following the breaker nip;

and a coating supply means applying coating to at least one surface of the web as it moves into said coating nip.

4,192,713

INTERMEDIATE PRESS NIP OF A PAPER MACHINE PRESS SECTION

Paavó J. Valkama, Leppaluoto B 1, 68610 Leppaluoto, Finland

Filed Feb. 17, 1978, Ser. No. 878,916

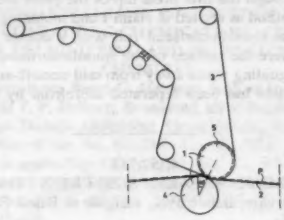
Claims priority, application Finland, Feb. 18, 1977, 770541

Int. Cl.[2] D21F *3/04*

U.S. Cl. 162—358 **2 Claims**

1. In a paper machine press section, an intermediate press nip including a pair of press rolls defining said nip between themselves, a web-conveying fabric means travelling between said press rolls while engaging one of said press rolls and conveying a web together with said fabric means through said nip defined between said rolls, and an additional endless fabric means lapping the other of said press rolls and travelling also through said intermediate nip while engaging the web at the surface thereof which is directed away from said web-conveying fabric means, so that the web is pressed between said web-conveying and additional fabric means while travelling through said intermediate press nip, said one press roll which engages said

web conveying fabric means being a smooth-surfaced press roll while the other press roll does not cooperate with any suction assist and has a surface formed with water-receiving recesses, said smooth-surfaced press roll being located rearwardly with respect to said other press roll in the direction of travel of said web-conveying fabric means through said intermediate nip so that the plane defined by the axes of said pair of press rolls is tilted with respect to a vertical plane and such that said web-conveying fabric means together with the web conveyed thereby laps said one smooth-surfaced press roll immediately subsequent to said intermediate press nip through an angle of at least 5°.

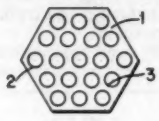


4,192,714

REACTOR SAFETY METHOD

Lawrence J. Vachon, Clairton, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1966, Ser. No. 600,695
Int. Cl.[2] G21C *7/06*
U.S. Cl. 176—22 **4 Claims**



1. In a gas cooled nuclear reactor having a ratio of fissionable material to moderator, wherein the fissionable material is uranium and the moderator is solid graphite having coolant channels and gaseous hydrogen coolant, control drums capable of maintaining the reactor in a subcritical state prior to start-up in the absence of hydrogenous liquid, and safety means for maintaining the reactor in a subcritical state prior to start-up in the event the reactor is immersed in a hydrogenous liquid comprising:

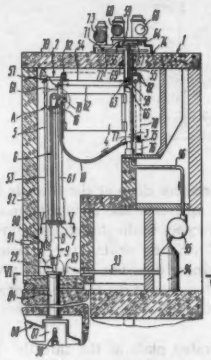
a coating of an essentially thermal neutron absorbing material on the inside surface of the coolant channels in an amount sufficient to prevent the reactor from attaining criticality when immersed in a hydrogenous liquid but not so great as to prevent the reactor from attaining criticality in the absence of hydrogenous liquid, wherein said coating vaporizes at a temperature lower than the operating temperature of the reactor.

4,192,715

FUEL ASSEMBLY HANDLING SYSTEM OF NUCLEAR REACTOR

Jury N. Koshkin, ulitsa Zvezdinka, 3, kv. 10; Georgy V. Ordynsky, ulitsa Strazh Revoljutsii, 9/6, kv. 9; Tsolak G. Shkhiyan, naberezhnaya Zhdanova, 6, kv. 16; Alexandr F. Shapkin, ulitsa Zvezdinka, 3, kv. 64; Alexandr I. Fadeev, ulitsa Engelsa, 21, kv. 46; Fedor V. Laptev, prospekt Lenina, 57, kv. 31; Vladimir I. Batjukov, ulitsa Prygunova, 9, kv. 29; Konstantin I. Korolkov, ulitsa Shalyapina, 19, kv. 77; Ivan V. Borodin, ulitsa Shalyapina, 15, kv. 2; Evgeny N. Chernomordik, ploschad Gorkogo, 2, kv. 30, and Vitaly G. Osipov, ulitsa Berezovskaya, 89, kv. 55, all of Gorky, U.S.S.R.

Filed Aug. 23, 1977, Ser. No. 826,976
Int. Cl.[2] G21C *19/20*; B66C *17/08, 1/10*
U.S. Cl. 176—30 **3 Claims**



1. A system for handling fuel assemblies of a nuclear reactor, comprising:

a sealed chamber having a cover, a closed wall, and a bottom;

an opening provided in said cover of said sealed chamber;

a recharging machine arranged inside said sealed chamber and having:

a vertical rotary tube extending through said opening in said cover of said sealed chamber, so that one of its ends protrudes from said sealed chamber;

a bracket mounted on an exterior surface of said vertical rotary tube;

a carrier tube suspended on said bracket and having a lower flange and an internal cavity;

a manipulator tube arranged inside said carrier tube, having an upper flange and an outer surface and moved along a predetermined path and through a prescribed angle by said rotary tube;

a rack hatched on said outer surface of said manipulator tube;

a first reduction gear having a housing with a gear of said first reduction gear arranged in said housing and interacting with said rack of said manipulator tube;

rollers arranged in said housing of said first reduction gear and interacting with said manipulator tube;

said housing of said first reduction gear being mounted on said lower flange of said carrier tube;

a second reduction gear having a second housing and mounted on said upper flange of said manipulator tube;

an opening provided in said second housing;

a stop rigidly mounted on said internal surface of said carrier tube;

an opening provided in said stop;

a pipe connection having an inlet and an outlet;

a carrier pipe of a stepped configuration, having an inlet and an outlet;

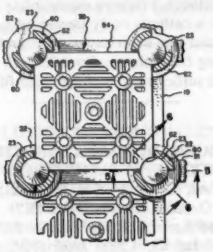
said outlet of said pipe connection communicating with said opening provided in said second housing;
said inlet of said pipe connection communicating with said outlet of said carrier pipe;
a device for circulating an insert cooling gas through said fuel assembly;
a flexible hose of said device for circulating communicating with said inlet of said carrier pipe;
said stop limiting the vertical travel of said carrier pipe;
a sprocket arranged in said second housing;
a chain interacting with said sprocket and having a first end and a second end;
a grip for clamping and transporting said fuel assembly mechanically coupled to one end of said chain and having axles and profiled grip pawls movably mounted on said axles;
a first drive having shafts interconnected by toothed pairs kinematically connecting the first drive to said first reduction gear;
a second drive having shafts interconnected by toothed pairs kinematically connecting the second drive to said second reduction gear;
a third drive having a shaft and a toothed pair kinematically connecting the third drive to said end of said vertical rotary tube, which protrudes outside said sealed chamber, and rotating said vertical rotary tube through a prescribed angle;
one of said shafts of said first drive and one of said shafts of said second drive extending through said opening in said cover of said sealed chamber and arranged inside said vertical rotary tube;
said drives being located outside said sealed chamber;
channels provided in said bottom of said sealed chamber on said path of movement of said manipulator tube;
inductive position transmitters for sensing the position of said manipulator tube positioned in said sealed chamber;
plugs installed in said closed wall of said sealed chamber,
said inductive position transmitters being arranged in said plugs,
the number of said inductive position transmitters being equal to that of said channels.

4,192,716

PERIPHERAL PIN ALIGNMENT SYSTEM FOR FUEL ASSEMBLIES

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Division of Ser. No. 754,625, Dec. 27, 1976, Pat. No. 4,127,445. This application Jan. 16, 1978, Ser. No. 869,801
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—78 **18 Claims**



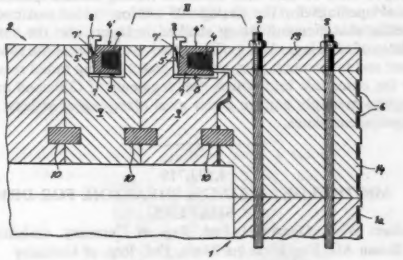
1. An improved nuclear reactor of the type having a vessel containing a core therewithin, said vessel and said core having parallel longitudinal axes, the improvement comprising:
(a) a nuclear core comprising a multiplicity of longitudinally extending, regularly spaced, vertically disposed fuel assemblies, each of said fuel assemblies having a plurality of depressions provided in its lateral periphery; and
(b) a core support structure disposed within said vessel for supporting and aligning said multiplicity of fuel assemblies, said core support structure including longitudinally extending alignment pins engaging said depressions of said fuel assemblies.

4,192,717

COVER FOR A NUCLEAR REACTOR PRESSURE VESSEL

Heiko Gross, Krefeld, Fed. Rep. of Germany, assignor to Siempelkamp Giesserei KG, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 749,757, Dec. 13, 1976, Pat. No. 4,124,447, which is a continuation-in-part of Ser. No. 638,075, Dec. 5, 1975, Pat. No. 4,057,162. This application Apr. 25, 1977, Ser. No. 790,536
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1974, 2457661; France, Oct. 28, 1975, 75 32869
Int. Cl.[2] G21C *13/04*
U.S. Cl. 176—87 **1 Claim**



1. A cover for a nuclear reactor pressure vessel comprising:
a disk formed by a plurality of one-piece cast bodies in contiguous abutting relationship, said disk comprising:
a central first array of said bodies lying in a common plane,
a second annular array of said bodies around said central first array and coplanar therewith,
a third annular array of said bodies around said second annular array and coplanar therewith,
a fourth annular array of said bodies around said third annular array and coplanar therewith, said bodies of said central first array being of isosceles hexagonal configuration, said bodies of said second annular array being of pentalateral and hexalateral plan configuration, said bodies of said third annular array being of quadrilateral plan configuration and said bodies of said fourth annular array being circular arc segments, said bodies of said second, third and fourth annular arrays forming wedge-shaped sections displsed around the center of said disk,
a circumferential abutment formed by and on said fourth annular array,
cable means extending around said abutment and bearing inwardly thereon, and
adjacent ones of said bodies formed with mutually interfitting means parallel to the plane of said disk for taking up forces transverse thereto.

4,192,718

BURST-PROTECTED STEEL PRESSURE VESSEL WITH DOUBLE PROTECTION IN RADIAL AS WELL AS AXIAL DIRECTION

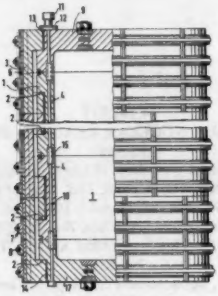
Nikolai Janakiev, Thywissenstrasse 69, 4150 Krefeld, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,483

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629735

Int. Cl.[2] G21C *13/04*

U.S. Cl. 176—87 14 Claims



1. Pressure vessel composed of wall elements, cover and bottom, wherein the wall is constructed of ring-segment-shaped steel or cast-steel elements having surface plates and axial openings for the passage of tension cables and cooling media, said elements being stacked in layers and the surface plates of each layer being offset relative to those of the superjacent and subjacent layers, and said plates having radial recesses at the outer side into which ring segments of C-shaped cross-section matingly engage under axial clamping of at least two superjacent plates.

4,192,719

METHOD OF MAKING A SHEARFOIL FOR DRY SHAVERS

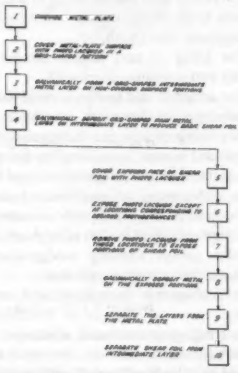
Robert Wich, Oberursel, Fed. Rep. of Germany, assignor to Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,134

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717632

Int. Cl.[2] C25D *1/08, 1/20, 7/06*

U.S. Cl. 204—11 7 Claims



1. In a method of making a dry shaver shearfoil capable of erecting the beard hair of a user, the steps of providing a shearfoil having a plurality of apertures and a surface adapted to contact the skin of a user; applying a coating of an electrically non-conductive substance on said surface of said shearfoil, excepting said apertures; galvanically depositing metallic material on said surface only about and immediately proximal to said apertures, so as to form collar-like protuberances adapted to erect a user's bear hair by tensioning the skin when the shearfoil is moved over the skin in contact therewith; and removing said non-conductive substance from said surface.

4,192,720

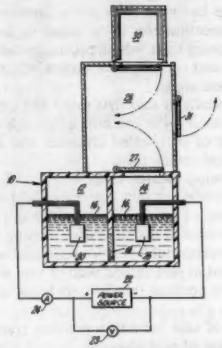
ELECTRODEPOSITION PROCESS FOR FORMING AMORPHOUS SILICON

Edward R. Bucker, Cranford, and James A. Amick, Princeton, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 16, 1978, Ser. No. 951,580

Int. Cl.[2] C25D *3/02, 5/50*

U.S. Cl. 204—14 N 15 Claims



1. A method for producing a stabilized photoconducting semiconductor film of amorphous silicon containing hydrogen, said method comprising:

electrolyzing a non-aqueous solution of a silicon solute selected from the group consisting of silane, halogenated silane, silicon halides or mixtures thereof dissolved in a liquid aprotic solvent, or a mixture of a liquid aprotic solvent and an aromatic solvent said solution further having a supporting ion additive electrolyte, soluable in said solution, and imparting sufficient conductivity thereto to permit the electro reduction of said solute;

reducing said silicon solute to electroplate a film containing silicon onto a cathode body immersed in said solution;

heat treating said film in an oxygen free ambient at a temperature ranging from above about 250° C. to about 350° C. for a period sufficient to stabilize said film.

4,192,721

METHOD FOR PRODUCING A SMOOTH COHERENT FILM OF A METAL CHALCONIDE

William R. Fawcett, and Andrzej S. Baranski, both of 30 Dean Ave., Guelph, Ontario, Canada (N1G 1K7)

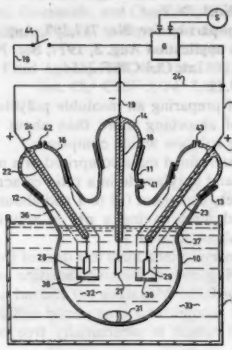
Filed Apr. 24, 1979, Ser. No. 32,762

Int. Cl.[2] C25D *3/02, 9/08*

U.S. Cl. 204—14 N 30 Claims

1. A method for producing a smooth coherent film of a metal chalconide of which the metal moiety is a metal selected from the group consisting of Cd, Pb, Hg, Cu, Bi, Co, Ni, and Tl, and the chalconide moiety is a chalcogen selected from the group consisting of S, and Se, comprising the steps of providing an electrolytic bath comprising an organic polar solvent having dissolved therein (a) a salt of said metal that is ionised and is electrically conductive in solution in said solvent and (b) said

chalcogen is elemental form; maintaining the bath at elevated temperature; subjecting the bath to electrolysis at a current density that is sufficiently low with respect to the surface area



of the cathode that a smooth coherent film of said chalconide is deposited on the cathode; and continuing the electrolysis until a desired thickness of film has built up on the cathode.

4,192,722

COMPOSITION AND METHOD FOR STANNATE PLATING OF LARGE ALUMINUM PARTS

Daniel J. Schardein, Richmond; Charles M. Rogers, Powhatan, and Diane N. Vice, Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jul. 25, 1978, Ser. No. 927,915

Int. Cl.[2] C25D *5/10, 5/44;* C23C *3/02*

U.S. Cl. 204—38 B **15 Claims**

1. An aqueous alkaline stannate solution, suitable for both immersion and electrolytic plating of aluminum alloys with tin, particularly as an activation step prior to subsequently plating said alloys with other metals such as bronze, which for activating the 7029 and 7129 aluminum alloys provides an allowable transfer time between the activation bath and the subsequent strike bath of at least 45 seconds, said solution comprising:

A. stannate values selected from the group consisting of sodium stannate, potassium stannate, and mixtures thereof;

B. polyhydroxy carboxylic acid anion values;

C. a hydroxyl compound selected from the group consisting of sodium hydroxide, potassium hydroxide, and mixtures thereof, at free equivalent KOH levels of about 24 grams per liter of said solution.

4,192,723

AQUEOUS SOLUTION OF MONOVALENT GOLD AND AMMONIUM SULFITE COMPLEX, PROCESS FOR THE PREPARATION THEREOF AND ELECTROLYTIC BATH OBTAINED THEREFROM FOR THE PLATING OF GOLD OR GOLD ALLOYS

Pierre Laude, Prevessin, France; Erwin Marka, Geneva, and Franco Zuntini, Morrens, both of Switzerland, assignors to Systemes de Traitements de Surfaces S.A., Switzerland

Filed Aug. 8, 1978, Ser. No. 931,914

Claims priority, application Switzerland, Aug. 29, 1977, 10523/77

Int. Cl.[2] C01G *7/00;* C25D *3/48*

U.S. Cl. 204—43 G **12 Claims**

1. An aqueous solution of a monovalent gold and ammonium sulfite complex, which is stable under slightly acidic conditions.

4,192,724

METHOD FOR ELECTROLYZING MOLTEN METAL CHLORIDES

Takeshi Minami, and Shinichi Toda, both of Tokyo, Japan, assignors to Chlorine Engineers Corporation, Ltd., Tokyo, Japan

Filed Oct. 10, 1978, Ser. No. 950,111

Claims priority, application Japan, Oct. 26, 1977, 52/127584

Int. Cl.[2] C25B *11/08;* C25C *3/02, 3/04, 3/06*

U.S. Cl. 204—67 **4 Claims**

1. A method for electrolyzing a molten chloride which comprises electrolyzing a molten bath of a chloride of a metal more base than hydrogen in an electrolytic cell containing an anode and a cathode to form chlorine at the surface of the anode and the metal at the surface of the cathode,

wherein the anode comprises an electrically conductive substrate resistant to corrosion by the molten bath of the metal chloride and the electrolysis products thereof and having thereon a coating of a noble metal oxide, and

with the electrolysis being carried out in the presence of an oxide or oxychloride of a metal more base than the metal formed at the cathode where the concentration of the oxide or oxychloride of the metal present in the molten bath, expressed as the mole fraction of free oxygen ion, is at least about 1×10^{-4}.

4,192,725

ELECTROLYTIC PRODUCTION OF HIGH PURITY ALKALI METAL HYDROXIDE

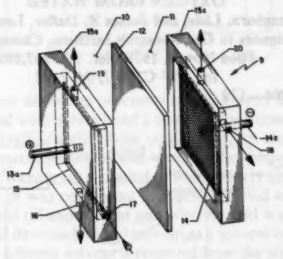
Ronald L. Dotson, Mentor, and Kevin J. O'Leary, Cleveland Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation of Ser. No. 191,424, Oct. 21, 1971, Pat. No. 4,025,405. This application Feb. 16, 1977, Ser. No. 769,100

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] C25B *1/16, 1/26*

U.S. Cl. 204—98 **24 Claims**



1. A process for the continuous production of alkali metal hydroxide substantially free from alkali metal halide and other impurities which comprises:

(a) continuously providing an aqueous alkali metal halide solution to the anode compartment of an electrolytic cell in which a dimensionally stable anode and a cathode are maintained in separate anode and cathode compartments, respectively, by a stable, hydrated, cation selective, hydraulically impermeable, electrically conductive membrane interposed between said anode and said cathode;

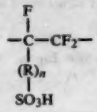
(b) electrolyzing the alkali metal halide solution while maintaining said solution at a temperature of from about 35° C. to about 100° C. and at a pH of about 1.0 to about 5.5;

(c) continuously removing alkali metal hydroxide solution, substantially free from alkali metal halide and other impurities, and hydrogen from the cathode compartment and halogen from the anode compartment;

said membrane consisting essentially of a film of a fluorinated copolymer having pendant sulfonic acid groups or derivatives

thereof and containing recurring structural units of the formula:

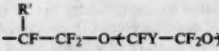
(1)



and

(2) —CXX'—CF_2—

wherein R represents the group



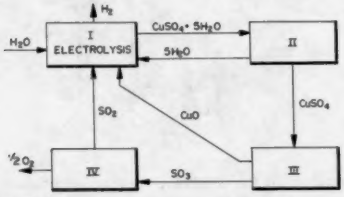
in which R' is fluorine or perfluoroalkyl of 1 to 10 carbon atoms, Y is fluorine or trifluoromethyl, and m is 1, 2 or 3, n, is 0 or 1; X is fluorine, chlorine, hydrogen or trifluoromethyl; and X' is X or CF_3—(CF_2—)$_z$ wherein z is 0 or an integer from 1 to 5; the units of formula (1) being present in an amount from 3 to 20 mole percent.

4,192,726

THERMOELECTROCHEMICAL PROCESS USING COPPER SULFATE FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER

Jon B. Pangborn, Lisle, and James R. Dafler, Lombard, both of Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 957,893
Int. Cl.[2] C25B *1/04, 1/12*
U.S. Cl. 204—129 **21 Claims**



1. A process for the production of hydrogen and oxygen from water comprising the steps:

electrolytically oxidizing in an electrolytic cell an aqueous solution of sulfur dioxide in the presence of copper oxide to produce copper sulfate in solution in the anode chamber while producing hydrogen in a separated cathode chamber and removing the produced hydrogen from the cycle;

crystallizing said copper sulfate solution to solid copper sulfate pentahydrate;

thermally dehydrating said copper sulfate pentahydrate to copper sulfate and steam; and

thermally decomposing said copper sulfate to copper oxide and sulfur dioxide for recycle to said electrolytic cell and to oxygen which is removed from the cycle.

4,192,727

POLYELECTROLYTE HYDROGELS AND METHODS OF THEIR PREPARATION

James A. Ward, Goshen, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 717,397, Aug. 24, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,082
Int. Cl.[2] C08F *2/54*
U.S. Cl. 204—159.12 **54 Claims**

1. A method of preparing an insoluble polyelectrolyte hydrogel capable of absorbing more than about 20 times its weight in aqueous solution which comprises:

forming a predetermined mass comprised of a mixture of an acrylate salt and acrylamide in a ratio of acrylate salt to acrylamide between about 0.3 to 1 and about 20 to 1, the predetermined mass having a pH in solution between about 6 and about 12; and

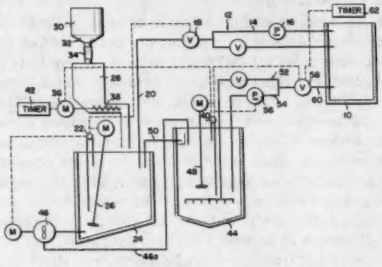
exposing the predetermined mass to a dose of from about 0.2 to about 10 Megarads of ionizing radiation at a dose rate between about 0.001 Megarads per second and about 10 Megarads per second for a time period sufficient to form said hydrogel which is substantially free of unreacted monomer.

4,192,728

METHOD FOR SUPPLYING POWDER INTO A COATING TANK AND ITS APPARATUS

Kunio Enomoto, Kawagoe; Uhee Kikuchi, Sayama; Masanori Kobori, Kawagoe; Suguru Kimura, Sayama; Satoru Kamiyama, Tokyo; Nobuaki Todoroki, Warabi, and Jun-ichi Yasukawa, Chigasaki, all of Japan, assignors to Taikisha Ltd.; Honda Motor Co., Ltd., both of Tokyo and Shinto Paint Co., Ltd., Amagasaki, all of, Japan

Filed Sep. 12, 1978, Ser. No. 941,456
Int. Cl.[2] C25D *13/24, 15/00, 17/00*
U.S. Cl. 204—181 R **4 Claims**



1. A method for supplying powder into a coating tank for electrophoretic powder coating comprising:

a first step of taking out a specified amount of plating bath from the coating tank, in which plating bath the electrophoretic powder is reduced as a result of coating work;

a second step including: supplying powder of much the same amount as the reduced amount of the powder to the plating bath taken out from the coating tank; agitating the taken out plating bath while supplying the powder to form a supplementary plating bath; and carrying out a first dispersion of the powder in the supplementary plating bath;

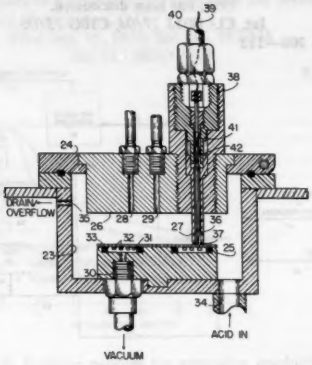
a third step including: carrying out a second dispersion of the powder in the supplementary plating bath to form a further uniformly dispersed state; and aging the supplementary plating bath with the dispersed powder therein; and

a fourth step of supplying to the coating tank sufficiently aged supplementary plating bath which is obtained from said third step and which has a high density of powder substantially uniformly dispersed therein.

4,192,729
APPARATUS FOR FORMING AN ALUMINUM INTERCONNECT STRUCTURE ON AN INTEGRATED CIRCUIT CHIP

Dan Cancelleri, Oceanside, and Charles E. Thompson, Carlsbad, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,916
Int. Cl.[2] C25F 3/14, 7/00
U.S. Cl. 204—272 1 Claim



1. Apparatus for forming an aluminum interconnect structure on a substrate which structure is formed of an aluminum layer having a hard barrier aluminum oxide layer on the surface thereof, and a resist pattern to define the interconnect structure, said apparatus comprising:

a chamber having a pedestal to receive and hold said substrate in an etchant-electrolyte solution;

an anode in said chamber to make electrical contact with said substrate;

a cathode in said chamber above said pedestal;

said chamber being provided with an etchant-electrolyte solution supply port to supply said chamber with said solution to etch said aluminum oxide layer so as to expose portions of said aluminum layer;

supply means coupled to said supply port to continuously supply said solution thereto;

voltage means coupled to said cathode and anode to supply voltages thereto at a finite time after such substrate has resided in said solution so as to anodize said exposed portions while said solution is being continuously supplied thereto;

said cathode having a planar surface to reside in parallel with said substrate and said anode extending through said cathode to make contact with said substrate;

a shield around said anode; and

nitrogen means coupled to said shield to supply nitrogen under pressure between said shield and said anode.

4,192,730
CARBONACEOUS LUTING PASTE AND AMBIENT TEMPERATURE LUTING PROCESS

Daniel Dumas, Saint-Priest; Serge Lacroix, Lyons, and Jean Vallon, Andresy, all of France, assignors to Societe des Electrodes et Refractaires Savoie, Paris, France

Filed Apr. 20, 1979, Ser. No. 31,952
Claims priority, application France, Apr. 20, 1978, 78 12447; Feb. 19, 1979, 79 04769
Int. Cl.[2] C25C 7/00
U.S. Cl. 204—294 14 Claims

1. A carbonaceous luting paste capable of being cold shaped, essentially comprising at least about 70% by weight of particulate calcined carbonaceous material, a high-temperature plasticizing agent comprising a water-insoluble organic carbonaceous compound, and an ambient-temperature plasticizing agent comprising a compound in aqueous solution.

4,192,731
COAL EXTRACTION PROCESS

Richard S. Stearns, Malvern, Pa., and Elmer J. Hollstein, Wilmington, Del., assignors to Suntech, Inc., Philadelphia, Pa.

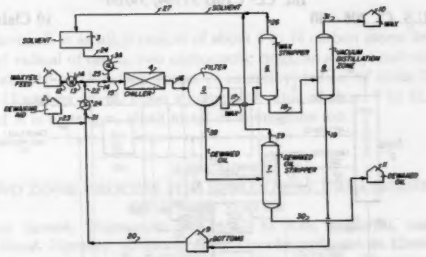
Filed Jun. 23, 1978, Ser. No. 918,216
Int. Cl.[2] C10G 1/00
U.S. Cl. 208—8 LE 5 Claims

1. A process for obtaining liquids from solid fossil fuels by heating at super critical temperature in the absence of added hydrogen a mixture of particulate solid fossil fuel and a solvent mixture of from about 50% to about 75% by weight of tetralin and from about 50% to about 25% of xylene whereby said solid fuel is extracted and the solid residue retains its particulate form.

4,192,732
RECOVERY AND RECYCLE OF DEWAXING AID

Takashi Onodera, Urawa; Kikuji Komine, Tokorozawa, and Fumio Ohashi, Ohi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,859
Int. Cl.[2] C10G 43/06, 43/08
U.S. Cl. 208—33 14 Claims



1. In a solvent dewaxing process wherein a waxy hydrocarbon oil is mixed with solvent and a dewaxing aid comprising a chlorinated paraffin/naphthalene condensate, an alpha-olefin polymer and mixture thereof and wherein the mixture of oil, solvent and dewaxing aid is chilled to form a slurry comprising solid particles of wax containing said dewaxing aid and a mixture of dewaxed oil and solvent and wherein said wax is separated from said dewaxed oil and solvent as a solvent-containing wax cake and wherein solvent is removed from the wax cake to produce substantially solvent-free wax, the improvement which comprises vacuum distilling off most of said solvent-free wax under conditions such that the dewaxing aid therein is not decomposed, said conditions including a temperature no higher than about 320° C., to form a wax bottoms containing said dewaxing aid and recycling said dewaxing aid-containing bottoms back into the dewaxing process wherein it is mixed with said waxy hydrocarbon oil.

4,192,733
SOLVENT DEWAXING WAXY HYDROCARBON OILS USING DEWAXING AID

Takashi Onodera, Urawa; Kikuji Komine, Tokorozawa; Fumio Ohashi, and Tsutomu Naito, both of Ohi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,811
Int. Cl.[2] C10G 43/06, 43/08
U.S. Cl. 208—33 16 Claims

1. In a solvent dewaxing process wherein a waxy hydrocarbon oil is mixed with a dewaxing aid and dewaxing solvent and

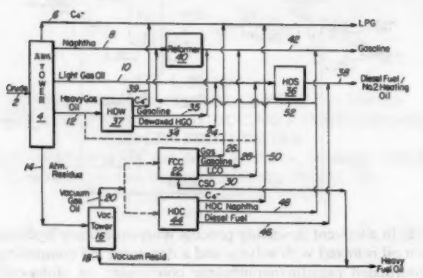
chilled to form a slurry comprising solid particles of wax and a mixture of dewaxed oil and solvent, the improvement which comprises using, as a dewaxing aid, a mixture of (A) a polymer of one or more paraffinic alpha-mono-olefins of from 4 to 30 carbon atoms, said polymer having an average molecular weight of from about 10,000 to 1,000,000 and (B) an olefin-vinyl acetate copolymer having a vinyl acetate content of from about 15–40 wt. % and an average molecular weight ranging from between about 50,000 to 1,000,000 and wherein components (A) and (B) are used in a weight ratio to each other ranging from about 95/5 to 5/95 of (A)/(B).

4,192,734

PRODUCTION OF HIGH QUALITY FUEL OILS

Robert T. Pavlica, Princeton; Thomas R. Stein, Cherry Hill, and Carl W. Streed, Haddonfield, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,948
Int. Cl.[2] C10G *37/04, 39/00*
U.S. Cl. 208—80 **10 Claims**



1. A process for upgrading crude oil to fuel oil comprising diesel fuel and No. 2 heating oil which comprises,

separating a crude oil to obtain naphtha boiling material, a light gas oil fraction boiling in the range of 320° to 650° F., a heavy atmospheric gas oil with an end boiling point in the range of 750° to 950° F. and a higher boiling atmospheric residua,

separating the atmospheric residua to obtain vacuum residua and heavy vacuum gas oil with an end point up to about 1075° F., processing the heavy vacuum gas oil through one or both of catalytic cracking with or without hydrogen under conditions to particularly increase the yield of a cycle oil product suitable for use as diesel fuel with or without further hydrogenation,

processing the heavy atmospheric gas oil with an end point in the range of 750° F. to 950° F. by catalytic hydrowaxing with a special class of crystalline zeolites represented by ZSM-5 zeolite to produce particularly a dewaxed gas oil of substantially improved pour point and cetane value,

hydrodesulfurizing a dewaxed heavy gas oil product of hydrodewaxing and

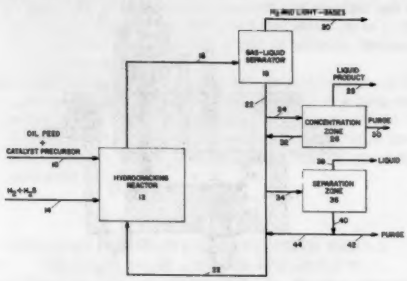
blending the gas oil products of cracking and dewaxing of acceptable sulfur concentration to form diesel fuel and/or No. 2 heating oil.

4,192,735

HYDROCRACKING OF HYDROCARBONS

Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 847,898, Nov. 2, 1977, Pat. No. 4,134,825, which is a continuation-in-part of Ser. No. 702,227, Jul. 2, 1976, abandoned. This application Oct. 30, 1978, Ser. No. 955,797
The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.
Int. Cl.[2] B01J *27/04*; C10G *13/06*
U.S. Cl. 208—112 **24 Claims**



1. A process for hydrocracking a hydrocarbon oil chargestock having a Conradson carbon content of less than about 5 weight percent, which comprises:

(a) adding to said chargestock a thermally decomposable metal compound in an amount ranging from about 25 to about 950 weight parts per million, calculated as the elemental metal, based on said oil chargestock, said metal being selected from the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements and mixtures thereof;

(b) heating said thermally decomposable metal compound within said chargestock in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas, and a gas comprising hydrogen and hydrogen sulfide, to produce a solid, non-colloidal catalyst within said chargestock, said solid catalyst comprising from about 25 to about 950 wppm of said metal, calculated as the elemental metal, based on said chargestock;

(c) reacting the chargestock containing said catalyst with hydrogen under hydrocracking conditions, in a hydrocracking zone, and

(d) recovering a hydrocracked hydrocarbon oil.

4,192,736

REMOVAL OF INDIGENOUS METAL IMPURITIES FROM AN OIL WITH PHOSPHORUS OXIDE-PROMOTED ALUMINA

Harris E. Kluksdahl, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 29, 1978, Ser. No. 964,766
Int. Cl.[2] C10G *29/16, 23/02*
U.S. Cl. 208—251 H **4 Claims**

1. In a process for upgrading an oil selected from the group consisting of petroleum and syncrude oils, fractions and mixtures thereof containing at least a substantial content of at least one metal impurity selected from the group consisting of metal impurities indigenous to said oils, by contact thereof under oil demetallizing conditions with a solid consisting esentially of alumina containing an oxide promoter, the improvement comprising (1) carrying out said contact with an alumina having a pore volume of at least 0.3 cc per gram and said oxide pro-

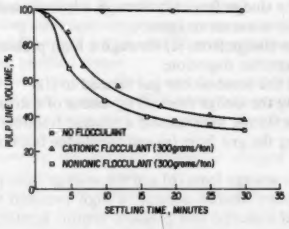
moter being phosphorus oxide in the range of from about 0.1 to 10 parts; calculated as phosphorus, for each 100 parts of alumina in parts by weight.

4,192,737

FROTH FLOTATION OF INSOLUBLE SLIMES FROM SYLVINITE ORES

Philip Thompson, Salt Lake City; Jerry L. Huiatt, Murray, and Don C. Seidel, Salt Lake City, all of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 15, 1978, Ser. No. 942,833
Int. Cl.² B03D 1/02
U.S. Cl. 209—5 **5 Claims**



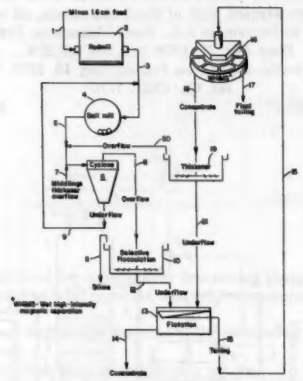
1. A froth flotation process for removing insoluble slimes from sylvinite ore in a saturated brine pulp prior to potash flotation, comprising utilizing as the froth flotation collector a mixture of distilled fuel oil and a defoamer consisting essentially of ethylene glycol monoacetate and floating off said insoluble slimes.

4,192,738

PROCESS FOR SCAVENGING IRON FROM TAILINGS PRODUCED BY FLOTATION BENEFICIATION AND FOR INCREASING IRON ORE RECOVERY

Arthur F. Colombo, and David M. Hopstock, both of Twin Cities, Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 953,395
Int. Cl.² B03B 1/00
U.S. Cl. 209—5 **15 Claims**



1. A process for recovery of iron from iron ore consisting essentially of subjecting the ore to cationic gangue flotation to produce a flotation concentrate as underflow and flotation tailings as overflow, and subsequently scavenging iron from said tailings by means of a wet high-intensity magnetic separator, whereby a magnetic concentrate of increased iron content and a magnetic tailings of reduced iron content are obtained.

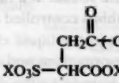
4,192,739

PROCESS FOR BENEFICIATION OF NON-SULFIDE ORES

Samuel S. Wang, Cheshire, and Eugene L. Smith, Jr., Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 21, 1977, Ser. No. 862,994
Int. Cl.² B03D 1/02
U.S. Cl. 209—166 **10 Claims**

1. A process for beneficiating non-sulfide ores selected from the group consisting of phosphate, fluorite, barite, hematite, taconite, magnetite and fluorspar which comprises classifying the ore to provide particles of flotation size, slurrying the classified ore in aqueous medium, conditioning the slurry with an effective amount of a collector combination and floating the desired mineral values, said collector combination comprising from about 1 to about 99 weight percent of a fatty acid derived from a vegetable or animal oil and, correspondingly, from about 99 to about 1 weight percent of a monoester of a sulfosuccinic acid of the general formula



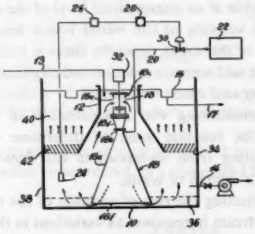
wherein R is an alkyl radical of about 4 to 18 carbon atoms an aryl radical of one to two carbocyclic rings, an alkaryl radical of about 7 to 18 carbon atoms, or an aralkyl radical of about 7 to 18 carbon atoms, n has a numerical value of about 1 to 12, and X is hydrogen, alkali metal or ammonium ion.

4,192,740

TWO ZONE PROCESS FOR BIOLOGICAL TREATMENT OF WASTE WATER

Guy Savard, Westmount; Robert G. H. Lee, Montreal, and Derek Hornsey, Roxboro, all of Canada, assignors to Canadian Liquid Air Ltd., Air Liquide Canada Ltee, Montreal, Canada

Continuation-in-part of Ser. No. 730,478, Oct. 7, 1976, abandoned. This application May 11, 1978, Ser. No. 905,008
Int. Cl.² C02C 5/10
U.S. Cl. 210—3 **8 Claims**



1. A process of treating waste water containing biodegradeable waste to provide a clarified liquid effluent and a disposable sludge, in which waste water is continuously passed through a single treating enclosure open to the atmosphere containing waste-degrading micoorganisms, to which oxygen is added to sustain the microorganisms and from which the clarified effluent is continuously overflowed and from which excess sludge and gases are removed, comprising, initially establishing:

(a) in a lower part of the enclosure a biological reaction zone

containing mixed liquor containing said microorganisms and in which a biological reaction to degrade the waste is conducted,

(b) in an upper part of the enclosure a clarification zone in which clarified liquid rises and overflows, and

(c) between the reaction and clarification zones a transition zone in which the liquid of the mixed liquor rises and the solids settle,

and continuously,

withdrawing a recycle stream of mixed liquor from the reaction zone and conducting the stream through an oxygen dissolving device disposed outside the reaction zone, adding influent waste water to it, dissolving oxygen in the stream and injecting the supplemented stream into a lower part of the reaction zone remote from the vicinity of withdrawal,

conducting the waste water into the recycle stream at a variable rate within a range related to the depth and surface area of the enclosure to provide a residence time within the reaction zone effective for the biodegradation of the waste and for the formation and settling of biological floc,

adding oxygen to said recycle stream at a rate to provide an oxygen concentration within a controlled range below the saturation level of oxygen in the liquid effective to meet the oxygen demand of the organisms and maintaining it in contact with the liquid in a contact zone of said stream for a time and under a pressure such that the oxygen is dissolved in the liquid,

controlling the overall flow rate of said recycle stream to a substantially constant rate several times that of the incoming waste water effective to provide:

(d) for dissolving the oxygen which is added to the recycle stream,

(e) an amount of dilution of the recycle stream entering the reaction zone effective to prevent the oxygen coming out of solution at an upper part of the reaction zone,

distributing the flow of said recycle stream entering the reaction zone to reach a substantial area of a lower part thereof:

(f) to provide a wide spread direct flow through the reaction zone, from the vicinity of injection to the vicinity of withdrawal, whereby there is controlled agitation effective to keep the solids dispersed, and good access of the organisms to the biodegradeable waste,

(g) and to provide at an intermediate level of the enclosure, and upward velocity of the mixed liquor less than the settling rate of the solids, whereby there is maintained in the enclosure said separate reaction and clarification zones intervened by said transistion zone,

continuously monitoring the concentration of dissolved oxygen in the reaction zone to determine variations thereof resulting from variations in the flow rate and concentration therein of waste,

periodically adjusting the rate of addition of the oxygen to the recycle stream in response to variations in the oxygen concentration in the reaction zone to maintain said concentration within said controlled range and at a level where there is substantially avoided effervescence that would lead to gas bubbles rising into the clarification zone,

continuously withdrawing said effluent from the clarification zone to keep pace with the influent waste water, and

continually removing excess sludge from the reaction zone and carbon dioxide from the mixed liquor.

4,192,741

PROCESS FOR TREATING SEWAGE EFFLUENT

Daniel H. Deeks, 231 Franklin Ave., Sea Cliff, N.Y. 11579, assignor to Daniel H. Deeks, Sea Cliff, N.Y.

Continuation-in-part of Ser. No. 817,448, Aug. 25, 1977, abandoned. This application Dec. 27, 1978, Ser. No. 956,242

Int. Cl.[2] C02G *1/04*

U.S. Cl. 210—6 **1 Claim**

1. A process for treating sewage effluent comprising:

(a) removing grit from the sewage effluent:

(b) passing the effluent to a drum separator and separating the effluent into a sludge fraction and a sewage fraction;

(c) passing the sludge fraction through a low pressure venturi and adding oxygen to produce an activated sludge;

(d) passing the activated sludge through a high pressure venturi for aerobic digestion;

(e) passing the sludge from (d) through a low pressure venturi to remove excess oxygen;

(f) passing the sludge from (e) through a high pressure venturi for anaerobic digestion;

(g) removing the combustible gas formed in (f);

(h) dewatering the sludge from (f) by means of a drum separator into a sludge fraction and a sewage fraction;

(i) incinerating the grit from (a) and the sludge fraction from (h);

(j) passing the sewage from (b) and the sewage from (h) into a low pressure venturi aerator, a high pressure venturi aerator, and a second low pressure venturi aerator;

(k) passing the sewage from (j) into a high pressure venturi filled with sand which contains nitrite bacteria to break down ammonia in the sewage into nitrites;

(l) passing the sewage from (k) into a short high pressure verturi filled with charcoal;

(m) passing the sewage from (l) into a high pressure venturi filled with sand which contains nitrate bacteria to convert nitrites into nitrates;

(n) passing the sewage from (m) into a high pressure venturi filled with sand which contains denitrifying bacteria to liberate nitrogen from the nitrates, and venting the nitrogen;

(o) passing the sewage from (n) through an additional charcoal filter to produce usable water.

4,192,742

PROCESS AND APPARATUS FOR THE BIOLOGICAL TREATMENT OF WASTE WATER

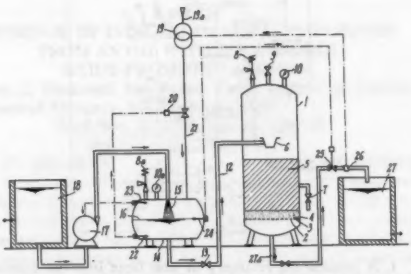
Jacques Bernard, Saint-Germain-en-Laye; Jean Bebin, and Jean-Pierre Hazard, both of Rueil-Malmaison, all of France, assignors to Degremont S.A., Rueil-Malmaison, France

Filed Apr. 28, 1978, Ser. No. 901,259

Claims priority, application France, May 10, 1977, 77 14196

Int. Cl.[2] C02C *5/10*

U.S. Cl. 210—17 **10 Claims**



7. A process for the continuous biological treatment of waste water, said process comprising:

introducing waste water to be treated from a waste water source into an enclosed gas tight oxygenation chamber;

introducing oxygen-containing gas into said oxygenation chamber, at a pressure higher than atmospheric pressure, and therein dissolving oxygen of said gas in said waste water in a quantity higher than the saturation concentration value of oxygen in the waste water at atmospheric pressure, while maintaining said pressure within said oxygenation chamber, thereby superoxygenating said waste water;

passing the thus superoxygenated waste water into an enclosed gas tight filtering chamber, separate from said oxygenation chamber and from said waste water source, while maintaining the interior of said filtering chamber at said pressure, and while avoiding the introduction into the interior of said filtering chamber of any oxygen other than that dissolved in said waste water;

passing said superoxygenated waste water through a biological filter bed within said filtering chamber, thereby forming purified water;

removing said purified water from said filtering chamber, and passing said purified water to a position of utilization separate from said oxygenation chamber and from said waste water source;

measuring the residual dissolved oxygen content of said purified water; and

regulating said pressure and thus the amount of oxygen dissolved in said waste water to be treated as a function of the measured residual dissolved oxygen content of said purified water.

4,192,743

PROCESS OF DEWATERING SLUDGE-TYPE MATERIAL AND INSTALLATION FOR CARRYING OUT THE PROCESS

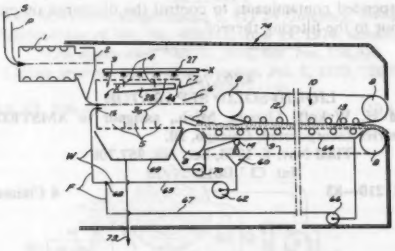
Wendel Bastgen, Betzdorf/Sieg; Helmut Schreiber, Bottenberg, and Eugen Grümbel, Niederfischbach, all of Fed. Rep. of Germany, assignors to Albert Klein KG, D 5241 Niederfischbach, Fed. Rep. of Germany

Continuation of Ser. No. 574,290, May 5, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,568

Claims priority, application Fed. Rep. of Germany, May 8, 1974, 2422208

Int. Cl.[2] B01D *17/08;* **C02C** *3/00*

U.S. Cl. 210—42 R **2 Claims**



1. A process for continuously dewatering sludge-type material containing solid particles, said process comprising the steps of:

feeding sludge-type material to be dewatered to a mixing means;

feeding flocculant to said mixing means;

mixing the sludge-type material and flocculant in the mixing means to form a flocculated sludge;

feeding the flocculated sludge to a reactor-thickener means;

removing water from the flocculated sludge in said reactor-thickener means;

continuously feeding the now dewatered flocculated sludge from the reactor-thickener means to an inlet of a filtering means;

removing additional water from the dewatered flocculated sludge in said filtering means;

discharging separated water from said reactor-thickener means into a first basin;

discharging filtrate separated from the dewatered flocculated sludge by the filtering means into a second basin;

pumping a portion of the water from the first basin to said filtering means to wash off adhering solid particles and flocculant in said filtering means;

collecting the wash water after passage through the filtering means and returning at least a portion thereof to the reactor-thickener means;

returning at least part of the filtrate discharged by the filtering means to the reactor-thickener means;

residual flocculant in the filtrate and the wash water returned to the reactor-thickener means producing further flocculation of sludge contained in the filtrate and wash water whereby the water in the first basin becomes relatively pure;

discharging the remaining portion of water from the first basin; and

discharging the dewatered sludge from the outlet of the filtering means.

4,192,744

TREATMENT OF AQUEOUS SYSTEMS

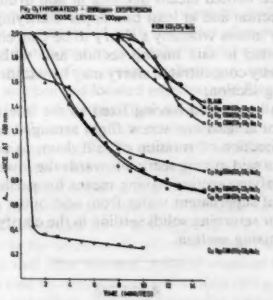
David R. Clark, Sale; Alan Marshall, and Michael A. Finan, both of Macclesfield, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,301

Claims priority, application United Kingdom, Nov. 2, 1976, 45464/76

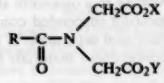
Int. Cl.[2] B01D *21/01;* **C02B** *1/20*

U.S. Cl. 210—54 **3 Claims**



1. A method of treating an aqueous system to flocculate dispersed Fe_2O_3 (hydrated) selectively therefrom which comprises

adding to the aqueous system from 0.1 to 500 ppm, based on the water to be treated, of a compound having the formula I



I

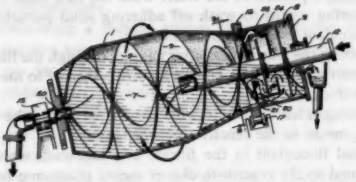
wherein R is N-undecye and X and Y are the same or different and each is an alkali metal, an alkaline earth metal, ammonium, an amine radical or hydrogen.

2. A method according to Claim 1 wherein X and Y are independently selected from the group consisting of sodium, potassium and ammonium radical.

4,192,745
RECLAMATION OF CEMENT SLURRY

Maxwell G. Hood, Brookvale, Australia, assignor to Fowlerex Pty. Limited, Brookvale, Australia

Filed Oct. 24, 1978, Ser. No. 954,287
Claims priority, application Australia, Oct. 24, 1977, PD2163
Int. Cl.[2] B01D 21/10
U.S. Cl. 210—66 9 Claims



1. A method for disposing of cement solids from a slurry of cement in water when said cement has been a component of an unset concrete comprising the steps of:

separating some of the water from said slurry to produce a more concentrated slurry;

agitating said concentrated slurry to keep it as a dispersion; and

mixing said concentrated slurry with newly produced concrete in the proportion such that the weight of concentrated slurry solids is from 0.1% to 5% of the weight of cement in the total concrete produced.

6. Apparatus for separating some of the water from a slurry of cement in water to produce a more concentrated slurry while maintaining said concentrated slurry as a dispersion, comprising

an inclined drum with a closed lower end and having water outlet means at its upper end;

rotation means to rotate said drum about its axis;

apertured baffled means defining in said drum a lower mixing section and at least one upper clarifying section;

delivery means whereby a slurry to be concentrated may be deposited in said mixing section and withdrawal means whereby concentrated slurry may be withdrawn from said mixing section;

said mixing section having fixed to the interior drum wall thereof at least one screw flight arranged with respect to the direction of rotation of said drum to urge solids settling in said mixing section towards the lower end thereof;

said clarifying section having means for permitting the outflow of supernatent water from said outlet means; and

means for returning solids settling in the clarifying section to said mixing section.

4,192,746
LIQUID CLARIFICATION SYSTEM

Kostas S. Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed May 24, 1978, Ser. No. 909,162
Int. Cl.[2] B01D 21/06, 33/26, 37/02
U.S. Cl. 210—73 S 10 Claims

1. A liquid clarification system for clarifying liquid bearing solid and/or chemical contaminant materials comprising

storage means for retaining in a quiescent state a quantity of unclarified liquid bearing suspended contaminant materials to effect a gravitational separation of at least a portion of the suspended contaminant materials from the unclarified liquid,

means for withdrawing the portion of unclarified liquid bearing the gravitationally separated contaminants into a storage reservoir,

a storage reservoir for retaining unclarified liquid bearing the gravitationally separated contaminants, means for controlling the percentage of contaminants in said unclarified liquid and means for discharging said unclarified liquid and contaminants at a controlled discharge output,

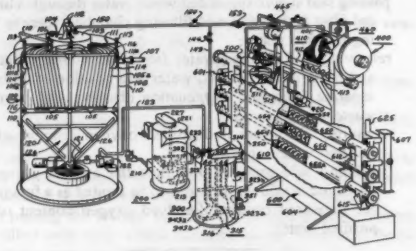
filtration means operatively connected to said storage reservoir for receiving said controlled discharge of contaminant bearing liquid,

said filtration means including filter means for removing the suspended contaminants from the unclarified liquid and discharging the liquid clarified thereby, and

means for conveying the discharge of clarified liquid from said filtration means to said storage reservoir for controlling the discharge output of the unclarified liquid and contaminants in said storage reservoir.

6. A method of clarifying liquids bearing solid and/or chemical contaminant materials comprising the steps of

retaining a quantity of unclarified liquid bearing suspended contaminant materials in a quiescent state and gravitation-



ally separating at least a portion of the suspended contaminants from the unclarified liquid,

withdrawing at least that portion of the unclarified liquid bearing the gravitationally separated suspended contaminants,

retaining that portion of the unclarified liquid bearing the gravitationally separated suspended contaminants, controlling the percentage of suspended contaminants in said unclarified liquid, and discharging said unclarified liquid and contaminants at a controlled discharge output,

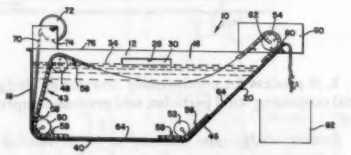
filtering said controlled discharge output of unclarified liquid and contaminants removing the suspended contaminants from the unclarified liquid, and

discharging the liquid clarified by filtering into the retained unclarified liquid bearing the gravitationally separated suspended contaminants to control the discharge output prior to the filtering thereof.

4,192,747
LIQUID-SOLID SEPARATOR

Richard H. Wykoff, Livonia, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 957,708
Int. Cl.[2] B01D 21/18
U.S. Cl. 210—83 4 Claims



1. A method particularly adapted for partially separating solids from a liquid comprising the steps of:

(1) flowing a supply of said liquid with solids therein into a tank by means of an inlet pipe located in an upper portion of said tank,

(2) maintaining a level of said liquid in said tank at a near constant level,
(3) flowing said liquid in a nonturbulent manner in a downward direction at a selective slow rate to pass below a lengthwise partition laterally offset in said tank,
(4) separating downwardly by gravity and by said downward flow up to 80% of said solids in said liquid as said liquid flows downwardly,
(5) flowing said liquid and a remainder of said solids upwardly at a selective faster rate to improve said downward separation on a side opposite said partition to be discharged through a weir opening,
(6) collecting said separated solids on a movable collection means forming in part a bottom of said tank,
(7) advancing said movable collection means periodically toward a discharge point exterior of said tank, and
(8) dumping said collected solids upon said solids reaching said discharge point,
wherein a substantial volume of said liquid may be processed to separate a substantial portion of said solid within said tank having selectively small volume.

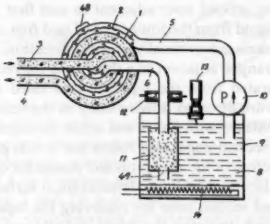
4. In a high volume liquid-solid separator particularly adapted for effecting partial separation, said separator, including a tank having an upper inlet to receive a flow of a liquid and solids suspended therein, the improvement thereof comprising,
a lengthwise partition carried by end walls of said tank to divide said tank into an inlet chamber and an outlet chamber with said inlet chamber having a dimensioned volume substantially greater than said outlet chamber to produce a slow downward flow in said inlet chamber and a faster upward flow in said outlet chamber, said partition having a bottom edge located above a bottom of said tank to allow a substantial portion of said liquid and a selective small portion of said solids exceeding 20% to flow to a weir outlet in said tank outlet chamber,
a pass-through portion carried in a bottom of said tank to allow a remainder portion proximating 15% of said liquid to pass from tank, and
a movable collection means in part formed into an endless loop, said means continuously covering said bottom of said tank and said pass-through section to collect a remainder portion of said solids.

4,192,748

DIALYSIS APPARATUS WITH SELECTIVE CHEMICAL ACTIVITY

Viktor H. Hyden, Geijersgatan 6, 411 34 Goteburg, Sweden

Continuation of Ser. No. 480,811, Jun. 19, 1974, abandoned. This application Nov. 2, 1976, Ser. No. 738,328
Claims priority, application Sweden, Jul. 5, 1973, 7309501
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—87 **10 Claims**



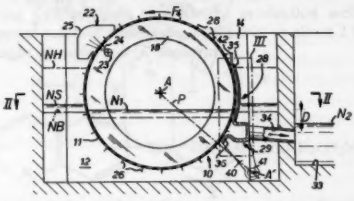
1. A dialysis apparatus comprising a dialysate container, cover means for said dialysate container, a dialysis container mounted on said cover means, said dialysis container having an inlet means and an outlet means, spectrometer means mounted on said cover means, a first fluid circuit means connecting said dialysis container and said dialysate container through said spectrometer means, said first fluid circuit including purification means in said dialysate container, a dialysis membrane for permitting passage of substances with molecular weights of up to between 10,000–15,000 removably mounted in said dialysis container and having a selectively chemically active therapeutic substance insolubilized on at least the surface facing the liquid to be dialyzed, pump means mounted on said cover means for pumping dialysate from said dialysate container to said dialysis container, a second fluid circuit means connecting said pump means with said dialysate container and said dialysis container, and at least one dosimeter means on said dialysate container for metering fluid into said dialysate container.

4,192,749

SCREENS FOR WATER INTAKES

Philip Jackson, Paris, France, assignor to E. Beaudry & Cie, Societe Anonyme, Paris, France

Filed Jun. 27, 1978, Ser. No. 919,605
Int. Cl.[2] B01D *33/02*
U.S. Cl. 210—107 **10 Claims**



1. A water screen for a water intake, said water screen comprising an endless filter element having a surface constructed and arranged for movement about an axis and for the general radial flow of water therethrough, means defining a water flow zone with an inlet thereinto in which water being filtered may flow through said filter element surface, and safeguarding means associated with said filter element surface for safeguarding living matter particularly fish in water to be screened, said safeguarding means including a recuperation channel having an open end located adjacent said filter element surface remote from said water flow zone inlet and generally facing said filter element surface with said open end being located below said axis at a height relative to said filter element surface so as to be immersed during the operation of said water screen, suction means attached to said recuperation channel for effecting water flow through said filter element surface into said recuperation channel in a direction through said filter element reverse to the intended direction of flow of water to be filtered through said filter element, a shield member extending upwardly from said recuperation channel open end adjacent to said filter element surface, said shield member being of a configuration complimentary to the shape and path of movement of said filter element surface and being generally uniformly spaced from said filter element surface, whereby living matter entrained against said filter element surface is directed into said recuperation channel open end without being directed up and around said filter element surface.

4,192,750

STACKABLE FILTER HEAD UNIT

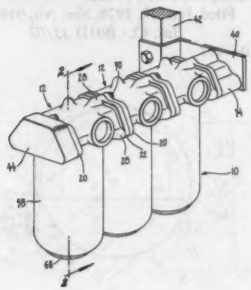
Lee E. Elfes, Bloomfield Hills, and Dale A. Wood, Canton, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 712,986, Aug. 9, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,424
Int. Cl.[2] B01D *27/10, 35/14*
U.S. Cl. 210—133 **2 Claims**

1. A stackable filter head unit (12) of use with a filter element (56) having a cylindrical outer surface and a chamber (72) within the filter element, the chamber being concentric with

the cylindrical outer surface, and a filter bowl (58) adapted to be disposed concentrically about the filter element (56) to define a second chamber therebetween; the filter head unit (12) including:

a member (14) having first and second opposed generally planar end surfaces (16, 18) interconnectable with corresponding surfaces of like filter head units to permit stacking of the filter head units, spaced apart generally parallel inlet and outlet passageways (36, 38) so dimensioned that die cast mold cores may be withdrawn therefrom, the passageways lying in a common first plane and extending between the first and second end surfaces and generally normal thereto, laterally offset annular side surfaces (50, 52) generally parallel to the first plane, the side surfaces being adapted to receive one end each of a filter element (56) and a filter bowl (58) in generally concentric fluid



tight relationships, a first cylindrical port (76) so dimensioned that a die cast mold core may be withdrawn therefrom, the first port extending between the outlet passageway (38) and the center of the side surfaces (50, 52) and placing said outlet passageway in communication with the chamber (72) within the filter element (56), and a second port (78) so dimensioned that a die cast mold core may be withdrawn therefrom, the second port extending between the inlet passageway (36) and the side surfaces (50, 52) and placing the inlet passageway in communication with the chamber surrounding the filter element, the centerline of cylindrical port (76) being concentric with the centerline of the chamber (72) and defining a common second plane with the centerline of the outlet passageway, the passageways and ports being so oriented with respect to each other as to facilitate die casting of the member.

4,192,751

BI-DIRECTIONAL FILTER DRIER

Paul V. Henton, St. Louis, and Roger J. Fait, Manchester, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 806,755, Jun. 15, 1977, Pat. No. 4,125,469. This application Aug. 25, 1978, Ser. No. 936,762

Int. Cl.[2] B01D *27/08, 35/02*

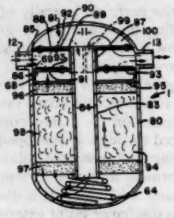
U.S. Cl. 210—136 **7 Claims**

1. A bi-flow filter drier comprising:

a shell, said shell defining a chamber, said shell having a first port and a second port;

filter means mounted in said shell between said ports; and

first valve means associated with said first port, and second valve means associated with said second port, said first and second valve means being operable independently of one another, each of said valve means including a one-way valve between said filter means and a respective port for admitting fluid from said respective port to said filter means and for being responsive to high pressure at said other port for blocking the flow of fluid from said filter means to said respective port, and another one-way valve between said filter means and its respective port responsive to high pressure at said other port for admitting fluid from said filter means to said respective port and being



further responsive to high pressure at said respective port for blocking the flow of fluid from said filter means to said respective port.

4,192,752

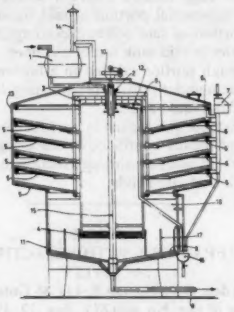
CONTINUOUS DECANTATION CLARIFIER FOR LIQUIDS CONTAINING SUSPENDED SOLIDS

Luiz A. C. de Mello Ribeiro Pinto, Bandeirantes Ave. 384, 14100 Ribeirao Preto, Sao Paulo, Brazil

Filed Feb. 14, 1978, Ser. No. 877,967

Int. Cl.[2] B01D *21/14*

U.S. Cl. 210—298 **7 Claims**



1. A continuous decantation clarifier, comprising means for defining a vertically extending first zone for directing liquid to be clarified downwardly so that the liquid is subjected to homogenization and flocculation, means for defining a vertically extending second zone adjacent to said first zone which receives the liquid from the lower end of said first zone and for directing the same in a vertically upward direction, said second zone being arranged adjacent to a third zone for receiving mud particles separated from the liquid in said third zone which mud particles are directed downwardly in the second zone to collide and coalesce with flakes and solids in suspension in the liquid in said second zone, said flakes and solids precipitating toward the bottom of the apparatus and means for defining said third zone including at least one frustoconical surface arranged adjacent to said second zone for receiving the liquid from the second zone and directing the liquid radially outwardly in a substantially horizontal direction, the mud particles being separated from the liquid in said third zone whereupon said mud particles are directed into said second zone where said particles are directed downwardly to collide and coalesce with the flakes and solids in suspension in the liquid in the second zone, the clarification liquid being collected close to the outer pheripheries of said at least one surface.

4,192,753

WELL COMPLETION AND WORKOVER FLUID HAVING LOW FLUID LOSS

David S. Pye, Brea; Julius P. Gallus, Anaheim, and Paul W. Fischer, Whittier, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Mar. 7, 1978, Ser. No. 884,128
Int. Cl.[2] C09K 7/02; E21B 43/25
U.S. Cl. 252—8.5 A 28 Claims

1. An aqueous well drilling, completion or workover fluid comprising a mixture of:

(1) about 8 to 60 pounds per barrel of a microemulsion comprising:

(a) about 45 to 85 parts by weight of water,

(b) about 15 to 55 parts by weight of solids comprising

(A) about 12 to 30 percent by weight of an oil-soluble surface active agent,

(B) about 20 to 38 percent by weight of a water-dispersible surface active agent,

(C) about 8 to 30 percent by weight of wax,

(D) about 20 to 50 percent by weight of a relatively low softening point resin having a softening point of about 90° to 134° C., selected from the group consisting of rosin acids, rosin esters, coumarone-indene resins, petroleum resins, polymers derived from one or more terpenes and condensation products of aromatic hydrocarbons with formaldehyde,

(2) about 270 to 400 pounds per barrel of water,

(3) about 14 to 91 pounds per barrel of a water-soluble inorganic salt, and

(4) about 1 to 8 pounds per barrel of a particulate relatively high softening point resin having a softening point of 135° C. or above selected from the group consisting of rosin acids, rosin esters, coumarone-indene resins, petroleum resins, polymers derived from one or more terpenes and condensation products of aromatic hydrocarbons with formaldehyde.

4,192,754

SOIL RESISTANT YARN FINISH COMPOSITION FOR SYNTHETIC ORGANIC POLYMER YARN

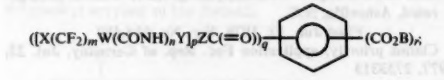
Robert M. Marshall, Chester, and Kimon C. Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 28, 1978, Ser. No. 974,203
Int. Cl.[2] D06M 13/34
U.S. Cl. 252—8.8 38 Claims

1. A yarn finish composition comprising:

a. about 15 to 80 weight percent of a solution of a salt of dioctyl sulfosuccinate, propylene glycol and water; and

b. about 20 to 85 weight percent of a fluorochemical compound having the formula



wherein the attachment of the fluorinated radicals and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than q; and $X(CF_2)_m$, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different.

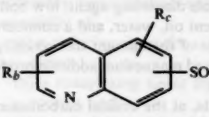
4,192,755

PROCESS FOR RECOVERING HYDROCARBONS FROM A HYDROCARBON-BEARING FORMATION

Kenoth H. Flournoy, Kingsville; Robert B. Alston, Missouri City, and William B. Braden, Jr., Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 802,146, May 31, 1977, Pat. No. 4,134,415, and a continuation-in-part of Ser. No. 664,740, May 8, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,328
Int. Cl.[2] E21B 43/22
U.S. Cl. 252—8.55 D 5 Claims

1. A process for recovering hydrocarbons from a hydrocarbon-bearing formation having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation a composition comprising an aqueous solution and recovering hydrocarbons through the production well, the said aqueous solution comprising about 0.01 to about 2.0 percent weight of surfactant of the formula:



wherein R_b is selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, R_c is selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, x is an integer of from 1 to 20 and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium, and about 0.01 to about 1.8 percent by weight of a soap selected from the group consisting of rosin soaps and naphthenic acid soaps and mixtures thereof.

4,192,756

ANTICAKING OF SODIUM CHLORIDE AND POTASSIUM CHLORIDE

Thomas C. Mondshine, Houston, Tex., assignor to Texas Brine Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 871,682, Jan. 23, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 960,057
Int. Cl.[2] C01D 3/26
U.S. Cl. 252—8.55 R 4 Claims

1. As a composition of matter having resistance to caking:

a. one or both of the group consisting of sodium chloride and potassium chloride having a particle size of 20 mesh and finer in an amount by weight of about 80% to about 99%; and

b. one or more metal lignosulfonate salts in an amount by weight of about 1% to about 20% said metal being selected from the group consisting of calcium, iron, ferrochrome, chromium, zinc, copper and magnesium .

4,192,757

ALKYL PHENOL SOLUTIONS OF ORGANO MOLYBDENUM COMPLEXES AS FRICTION REDUCTING ANTIWEAR ADDITIVES

Philip W. Brewster, Camlachie, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 21, 1978, Ser. No. 898,769
Int. Cl.[2] C10M 1/38, 1/48, 1/54
U.S. Cl. 252—32.7 E 15 Claims

1. In a concentrate consisting essentially of one part by weight of an organo molybdenum complex obtained from a solution reaction of 1-2 moles of a C_1 to C_{50} hydrocarbyl

substituted thio-bis-phenol, 1–2 moles of an amine containing from 1 to 5 nitrogens and from 2 to 20 carbons and 1 molar equivalent of a source of molybdenum of the class consisting of molybdic trioxide, ammonium thiomolybdate, ammonium bismolybdate molybdenum halides and ammonium tetrahydrate, the improvement of using from 0.25 to 5 parts by weight of an alkyl substituted phenol wherein said alkyl group contains from 5 to 50 carbons for said reaction solvent which is carried out at a temperature of from 135° C. to 225° C. whereby a more readily filterable reaction product is obtained.

4,192,758

OVERBASED MAGNESIUM SULFONATE PROCESS

Charles R. Dickey, Covina, and Paul M. Williamson, Garden Grove, both of Calif., assignors to Bray Oil Company, Inc., El Monte, Calif.

Filed May 1, 1978, Ser. No. 901,612
Int. Cl.[2] C10M *1/40*
U.S. Cl. 252—33 **22 Claims**

1. In the process of preparing overbased magnesium additive by the reaction of commercial grades of magnesium oxide with carbon dioxide and water in the presence of an oil-soluble dispersing agent, the improvement comprising:

(1) forming a mixture of oil-soluble dispersing agent, low boiling hydrocarbon solvent, diluent oil, water, and a commercial magnesium oxide in excess of the amount theoretically required to produce an overbased magnesium additive product of the desired alkali value;

(2) adding thereto carbon dioxide, at the critical carbonation rate, said critical carbonation rate being defined as that rate of carbon dioxide addition necessary to maintain such a CO_2 concentration in the system that the rate of conversion of magnesium oxide to colloidally dispersed magnesium carbonate is at a maximum relative to the rate of conversion of magnesium oxide to undispersed reaction products, and continuing said carbon dioxide addition until the reaction of carbon dioxide and magnesium oxide is substantially completed;

(3) removing from the carbonated reaction mixture water, low boiling hydrocarbon solvent, and undispersed solids, thereby recovering the overbased magnesium additive product in the form of a clear submicronic colloidal dispersion in the diluent oil.

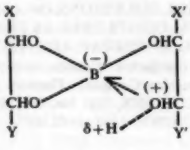
4,192,759

AUTOMOTIVE BRAKE FLUID COMPOSITIONS INCLUDING SEMIPOLAR BORATES AND HETEROBORATES

Hiroyoshi Hamanaka, Yachiyo, Japan, assignor to Toho Chemical Industry Co., Ltd., Tokyo, Japan

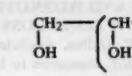
Filed Jul. 17, 1978, Ser. No. 925,600
Int. Cl.[2] C10M *3/48*
U.S. Cl. 252—78.1 **9 Claims**

1. A brake fluid composition for automobiles comprising a mixture of 1–10% by weight of at least one semipolar borate represented by the general formula,

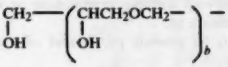


(I)

wherein X, X', Y and Y' each are hydrogen atom, a group of the formula,



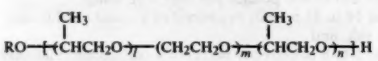
wherein a is 0, 1, 2 or 3, or a group of the formula,



wherein b is 1 or 2 provided that at least two hydroxyl groups are present in X+X'+Y+Y'; 9–50% by weight of at least one heteroborate represented by the general formula,

$$[\{C_4H_9O-(CH_2CH_2-O-)_k-\}_p\{CH_3O-(CH_2CH_2O-)_j\}_q]B \quad \text{(II)}$$

wherein p is a positive number of 1 to 3/2, q is a positive number of 3/2 to 2 and p+q is 3, k is a positive number of 1 to 3, and j is a positive number of 3 to 5; and 40–90% by weight of at least one polyalkylene glycol monoalkyl ether represented by the general formula,



(III)

wherein R is a C_1–C_4 alkyl, l is 0 or a positive number of 3/2 or less, n is 0 or a positive number or 3/2 or less, and m is a positive number of 3 to 5 provided that there are the following relationships between l, m and n;

$$3 \leqq (l+m+n) \leqq 5$$

and

$$0 \leqq l+n/(l+m+n) \leqq \tfrac{1}{3}.$$

4,192,760

COOLING AGENT MIXTURE CONTAINING ETHYLENE GLYCOL MONOACETATE, ETHYLENE GLYCOL DIACETATE, AND GLYCOL MONOMETHYL ETHER FOR LOW-TEMPERATURE FREEZING PROCESSES

Rudolf Jünger, Kreuzau, and Hans-Joachim Maulhardt, Duren, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 12, 1978, Ser. No. 914,480
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733313
Int. Cl.[2] C09K *5/00*
U.S. Cl. 252—79 **4 Claims**

1. A cooling agent mixture consisting essentially of, based on the total weight of the mixture,

(a) from about 15 to about 35 percent ethylene glycol monoacetate and ethylene glycol diacetate, the ratio of the monoacetate to the diacetate being from about 1:9 to about 9:1,

(b) from about 35 to about 65 percent glycol monomethyl ether,

(c) from about 0 to about 17 percent monovalent, short-chained alcohols,

(d) from about 0 to about 3 percent of a corrosion inhibitor, and

(e) from about 0 to about 40 percent water.

4,192,761

DETERGENT COMPOSITIONS CONTAINING A SUDS REGULATING SYSTEM

Philippe Peltre, Paris, and Alain Lafleur, Bretigny-sur-Orger, both of France, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 20, 1978, Ser. No. 917,444

Claims priority, application United Kingdom, Jun. 23, 1977, 26323/77

Int. Cl.[2] C11D *7/26, 7/18*

U.S. Cl. 252—99 17 Claims

1. A granular detergent composition having superior suds regulating capacity over a broad range of usage conditions comprising: from about 2% to about 70% by weight of an organic surface-active agent; and from 0.01% to about 5% by weight of a suds regulating system comprising:

A. from 99.9% to about 75% by weight of the suds regulating system of a mixture consisting of

i. from about 30% to about 98% by weight of a substantially water-insoluble liquid, at room temperature and atmospheric pressure, hydrocarbon; and

ii. from about 70% to about 2% by weight of an adjunct material selected from the group of:

1. a substantially water-insoluble solid hydrocarbon having a melting point in the range from about 35° C. to about 110° C.;

2. a fatty ester of mono- or polyhydric alcohols having from 1 to about 40 carbon atoms in the hydrocarbon chain, and mono- or polycarboxylic acids having from 1 to about 40 carbon atoms in the hydrocarbon chain with the provisos that the total number of carbon atoms in the ester is equal to or greater than 16 and that at least one of the hydrocarbon radicals in the ester has 12 or more carbon atoms; and

3. mixtures thereof.

B. from 0.1% to about 25% by weight of the suds regulating system of a hydrophobic silica suds regulating agent.

4,192,762

RADIATION CURABLE URETHANE COMPOSITIONS

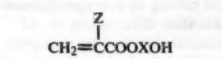
Claiborn L. Osborn, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,102

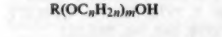
Int. Cl.[2] C08G *18/12;* C08L *75/04*

U.S. Cl. 252—182 5 Claims

1. A radiation curable urethane composition comprising the reaction product of (I) an organic polyisocyanate, (II) an hydroxyalkyl acrylate of the formula



wherein Z is hydrogen or methyl and K is a divalent alkylene group of from 2 to 5 carbon atoms and (III) an hydroxyl compound of the formula:



wherein R is a member of the group of alkyl having from 1 to 25 carbon atoms, alkaryl or aralkyl having from 7 to carbon atoms, aryl having from 6 to 10 carbon atoms, or cycloalkyl having from 5 to 10 ring carbon atoms; n is an integer having a value of from 2 to 4; and m is an integer having a value of from 1 to 70; and wherein the mole percent of (II):(III) is from 50 to 98:50 to 2.

4,192,763

CHLORINE TABLET AND THE PREPARATION THEREOF

Pieter W. W. Buchan, 2 Nicolyn Ave., Ruiterhof, Randburg, South Africa

Filed Feb. 3, 1978, Ser. No. 874,864

Claims priority, application South Africa, Feb. 16, 1977, 77/0938

Int. Cl.[2] C11D *3/48;* C01B *11/06;* C02B *1/18*

U.S. Cl. 252—187 H 13 Claims

1. A method of forming a chlorine tablet, which includes the step of admixing calcium hypochlorite with chloride of lime and pressing said mixture into a tablet.

4,192,764

STABILIZING COMPOSITION FOR A METAL DEPOSITION PROCESS

Bruce S. Madsen, Tinicum Township, Upper Bucks County, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 848,001, Nov. 3, 1977, Pat. No. 4,133,908. This application Oct. 16, 1978, Ser. No. 951,805

Int. Cl.[2] C23C *3/02*

U.S. Cl. 430—455 13 Claims

1. A stabilizing composition for a real image comprising a non-noble metal catalytic species, said composition consisting essentially of:

(a) a reducing agent for said non-noble metal catalytic species,

(b) a complexing agent for said non-noble metal catalytic species, and

(c) an accelerator comprising a cyanide complex of a Group VIII metal.

4,192,765

CONTAINER FOR RADIOACTIVE NUCLEAR WASTE MATERIALS

John M. Bird, 681 Synder Hill Rd., Ithaca, N.Y. 14850, and Alfred E. Ringwood, Canberra, Australia, assignors to John N. Bird, Ithaca, N.Y.

Filed Feb. 15, 1978, Ser. No. 878,113

Int. Cl.[2] G21F *1/08, 5/00, 9/00*

U.S. Cl. 252—301.1 W 10 Claims

1. A container for radioactive nuclear waste materials which are ultimately to be buried underground, said container being composed of a native nickel-iron alloy produced under thermodynamically stable conditions within serpentinite-type rocks and possessing a composition in the range exhibited by the natural materials awaruite and josephinite.

4,192,766

COMPOSITION FOR DECREASING WATER RESISTANCE TO MOVEMENT

Jon S. VanCleave, West Des Moines, Iowa, assignor to United Chemical Corporation, Des Moines, Iowa

Division of Ser. No. 571,610, Apr. 25, 1975, Pat. No. 4,073,983. This application Nov. 11, 1977, Ser. No. 850,736

Int. Cl.[2] C08L *91/00;* C09K *3/30*

U.S. Cl. 252—305 7 Claims

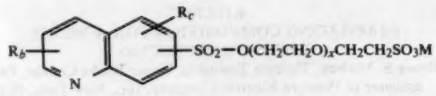
1. A composition for decreasing the interfacial surface tension as well as the contact angle between an object moving through a moisture laden environment and the moisture, thereby allowing the object to move at an increased speed with the same applied moving force or at the usual speed with less applied moving force, said composition consisting essentially of from about 5% to about 20% by weight of a non-ionic surface active agent or mixtures thereof which is water insoluble, said agent or blends of agents having an HLB of from about 7 to about 9, and from 80% to about 95% by weight of a pressurized nonflammable propellant.

4,192,767
AQUEOUS SURFACTANT SOLUTIONS AND OIL-IN-WATER EMULSIONS

Kenoth H. Flournoy, Kingsville; Robert B. Alston, Missouri City, and William B. Braden, Jr., Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 802,146, May 31, 1977, Pat. No. 4,134,415, and a continuation-in-part of Ser. No. 664,740, Mar. 8, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,326
Int. Cl.[2] B01F *17/42, 3/10*
U.S. Cl. 252—312 11 Claims

1. An oil-in-water emulsion comprising a hydrocarbon phase and as the aqueous phase an aqueous solution comprising about 0.01 to about 2.0 percent weight of surfactant of the formula:



wherein

R_b is selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms,

R_c is selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, x is an integer of from 1 to 20 and

M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium, and from about 0.01 to about 1.8 percent by weight of a soap selected from the group consisting of rosin soaps and naphthenic acid soaps and mixtures thereof.

4,192,768
ELECTRICAL TERMINAL CORROSION PREVENTATIVE AND METHOD FOR USING SAME

Stanley F. Budnick, 1072 E.Broadway, Winona, Minn. 55987

Filed Feb. 23, 1978, Ser. No. 880,337
Int. Cl.[2] C23F *11/04, 11/12, 11/18*
U.S. Cl. 252—389 R 22 Claims

1. An electrical terminal corrosion preventative, comprising:

a major proportion of a paste-like, heat resistant lubricating grease having a Dropping Point of at least 250 degrees Fahrenheit;

a water soluble inorganic acid neutralizing agent;

water;

an emulsifying agent capable when combined with said water and said neutralizing agent of facilitating substantially uniform dispersion of said combined water and neutralizing agent in said grease, said neutralizing agent being active to neutralize an acid when said neutralizing agent is dispersed in said grease.

4,192,769
RUST INHIBITOR ADDITIVE COMPOSITIONS, METHOD OF MAKING, AND AQUEOUS FLUIDS CONTAINING THE SAME

Richard W. Jahnke, Mentor-On-The-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 12, 1978, Ser. No. 905,502
Int. Cl.[2] C23F *11/14, 11/12*
U.S. Cl. 252—389 R 49 Claims

1. A stably water-dispersible rust inhibiting composition prepared by the process which comprises reacting

(A) at least one aliphatic polycarboxylic acid acylating agent characterized by the presence within its structure of an aliphatic hydrocarbyl-substituent with

(B) at least one hydroxy-substituted aliphatic amine, and

(C) at least one basically reacting alkali metal compound.

4,192,770
CRACKING CATALYST RESTORATION WITH BORON COMPOUNDS

David M. Singleton, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

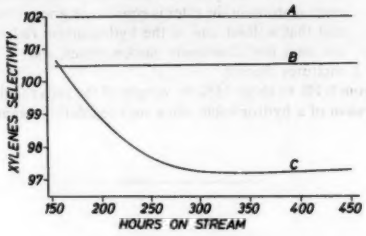
Filed May 24, 1978, Ser. No. 909,234
Int. Cl.[2] B01J *29/38, 21/10, 21/02;* C10G *11/04*
U.S. Cl. 252—414 8 Claims

1. A process for restoring the selectivity of a zeolite-containing cracking catalyst which has become contaminated with at least one metal from the group consisting of nickel, vanadium and iron which comprises contacting said catalyst with a sole treating agent consisting essentially of at least one boron compound for a time sufficient to apply less than 1%w of boron to the cracking catalyst and to restore the selectivity of said catalyst.

4,192,771
PROCESS FOR DISPERSAL AND REDISPERSAL OF PLATINUM GROUP METALS COMPRISING SULPHIDING IN A STREAM OF INERT GAS

Bernard W. Burbidge, Leatherhead, England, and David M. Rees, Swansea, Wales, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed May 1, 1978, Ser. No. 901,789
Claims priority, application United Kingdom, May 4, 1977, 18648/77
Int. Cl.[2] B01J *37/20, 37/24, 23/40, 23/96*
U.S. Cl. 252—415 10 Claims



1. A method for the redispersal or dispersal of a platinum group metal on a catalyst comprising an oxidised platinum group metal component and a refractory inorganic support, which method comprises the steps of treating the oxidised catalyst with a stream of inert gas containing a sulphiding agent to deposit sulphide on the catalyst in the range of 0.1 to 1% by weight of the catalyst, and reducing the sulphided catalyst in a stream of hydrogen-containing gas at a temperature in the range 200° to 600° C. to give a maximum catalyst temperature of 550° C. at a gas hourly space velocity of 200 to 6000 v/v/hr. to produce a catalyst having an average platinum group metal crystalline size of less than 20A.

4,192,772
SOLID CATALYST AND PROCESS FOR THE PREPARATION THEREOF

Eugene Berger, Brussels, and Charles Bienfait, Keerbergen, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Division of Ser. No. 675,320, Apr. 9, 1976, Pat. No. 4,109,071. This application Apr. 4, 1978, Ser. No. 893,517
Claims priority, application Luxembourg, Apr. 14, 1975, 72278
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 C 20 Claims

1. In a solid catalyst complex comprising the reaction product formed from reacting together

(1) at least one magnesium compound (M) selected from

oxygen-containing organic compounds of magnesium and halogen containing compounds of magnesium; with

(2) at least one titanium compound (T) selected from oxygen-containing organic compounds of titanium and halogen containing compounds of titanium; with

(3) at least one zirconium compound (Z) selected from oxygen-containing organic compounds of zirconium and halogen containing compounds of zirconium; and with

(4) at least one aluminum halide (A) of the formula AlR'_nX_{3-n} wherein R' is a C_1–C_{20} hydrocarbon, X is a halogen and n is a number such that $0 \leqq n \leqq 3$:

said oxygen containing organic compounds of magnesium, titanium and zirconium contain at least one metal-oxygen-organic radical sequence and the organic radicals contain from 1 to 20 carbon atoms; said halogen-containing compounds of magnesium, titanium, and zirconium contain at least one halogen to metal bond sequence; the improvement wherein said compounds (M), (T), (Z) and (A) are used in amounts that satisfies the equation

$$(Zr/Ti).(X/Mg+Zr+Ti)>3$$

where Mg, Zr, Ti and X represent the amounts, in gram-equivalents, of magnesium, zirconium, titanium and halogen of said compounds.

4,192,773

OXYGEN ABSORBENT

Yoshio Yoshikawa, Ushiku; Takanari Nawata, Tokyo; Akira Amemiya, Tokyo; Toshio Komatsu, Tokyo; Yoshiaki Inoue, Tokyo, and Megumu Yuyama, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 17, 1978, Ser. No. 934,489

Claims priority, application Japan, Aug. 24, 1977, 52/101452

Int. Cl.[2] B01J *31/26, 27/08*

U.S. Cl. 252—429 R **23 Claims**

1. An oxygen absorbent comprising (a) metal halide-coated metal powder having at least one metal halide coated on the surface of at least one metal powder, the amount of metal halide coated being in the range of from about 0.001 part to about 10 parts by weight per 100 parts by weight of the metal powder, and the water content of the metal halide-coated metal powder being less than 1% by weight on the basis of total weight of the metal halide-coated metal powder, and (b) a water-containing particulate material having a water content of more than 1% by weight obtained by impregnating the particulate material with a water-containing humidity controlling agent.

13. A process for producing an oxygen absorbent which comprises packing (a) metal halide-coated metal powder having at least one metal halide coated on the surface of at least one metal powder, the amount of metal halide coated being in the range of from about 0.001 part to about 10 parts by weight per 100 parts by weight of the metal powder, and the water content of the metal halide-coated metal powder being less than 1% by weight on the basis of total weight of the metal halide-coated metal powder, and (b) a water-containing material in an air-permeable bag so that the metal halide-coated metal powder does not contact the water-containing material before packing them, said water-containing material being water-containing particulate material having a water content of more than 1% by weight obtained by impregnating the particulate material with a water-containing humidity controlling agent.

4,192,774

PREPARATION OF AN ACTIVE $TiCL_3$ CATALYST

Andras G. T. G. Kortbeek, and Adrianus A. van der Nat, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 18, 1979, Ser. No. 4,435

Claims priority, application United Kingdom, Jan. 27, 1978, 3377/78

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **4 Claims**

1. In the preparation of an active $TiCl_3$ olefin polymerization catalyst component by reducing $TiCl_4$ with an organo-aluminum compound which comprises:

(a) premixing $TiCl_4$ with a complexing agent in an inert organic solvent, the molar ratio complexing agent: $TiCl_4$ being within the range from 0.3:1 to 2:1;

(b) premixing the organo-aluminum compound with a complexing agent in an inert organic solvent, the molar ratio complexing agent: organo-aluminum compound being at least 0.25:1;

(c) carrying out the reduction to $TiCl_3$ and precipitation of $TiCl_3$ in a single step by combining at least one stoichiometric equivalent of $TiCl_4$ in the premixed composition of step (a) with one stoichiometric equivalent of the organo-aluminum compound in the premixed composition of step (b) over a period of less than one hour at a temperature within the range 60° to 110° C.,

resulting in a reaction mixture having a concentration of at least 0.2 moles/liter of $TiCl_3$ particles having an average particle size of 50–500 millimicrons, the improvement which comprises subjecting said $TiCl_3$ particles to size reduction treatment to reduce the average particle size to less than 50 millimicrons and classifying the resulting $TiCl_3$ particles to recover a fraction having an average particle size of about 0.1–30 millimicrons.

4,192,775

OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

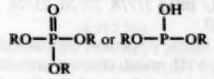
Continuation-in-part of Ser. No. 724,484, Sep. 20, 1976, which is a continuation-in-part of Ser. No. 558,504, Mar. 15, 1975, Pat. No. 3,984,351. This application Jul. 17, 1978, Ser. No. 925,510

Int. Cl.[2] C08F *4/78*

U.S. Cl. 252—430 **12 Claims**

1. A process for preparing an olefin polymerization catalyst system which comprises:

(a) depositing an organophosphoryl chromium reaction product of chromium trioxide and a phosphorus compound having the formula



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen but at least one R is other than hydrogen, upon a solid inorganic support material;

(b) depositing aluminum acetylacetonate upon said support material; and,

(c) heat-activating said supported organophosphoryl chromium reaction product and aluminum acetylacetonate in a non-reducing atmosphere at a temperature above about 300° C. up to the decomposition temperature of the support material.

4,192,776

CATALYSTS AND PROCESS FOR THE AMMOXIDATION OF OLEFINS

Robert K. Grasselli, Chagrin Falls; Arthur F. Miller, and Harley F. Hardman, both of Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 735,859, Oct. 27, 1976, which is a continuation-in-part of Ser. No. 426,175, Dec. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 85,722, Oct. 30, 1970, abandoned. This application Jan. 3, 1978, Ser. No. 866,203

Int. Cl.[2] B01J *21/02, 27/14, 23/10, 23/84*

U.S. Cl. 252—432 6 Claims

1. A catalyst having the formula

$$A_aD_bE_fG_cFe_dBi_3Mo_{12}O_x$$

wherein

A is a rare earth metal or mixture thereof;

D is an alkali metal;

E is nickel, cobalt, magnesium, zinc, cadmium, calcium or mixture thereof;

G is phosphorus, boron, arsenic, or mixtue thereof;

and wherein

a is greater than zero to about 3;

b is about 0.1 to about 20;

c is 0 to about 3;

d is about 0.1 to about 8;

e is about 0.1 to about 6;

f is about 8 to about 16;

g is greater than zero to about 3; and

x is a number determined by the valence requirements of the other elements present.

4,192,777

PREPARATION AND USE OF SUPPORTED POTASSIUM (OR RUBIDIUM)-GROUP VIII-METAL CLUSTER CATALYSTS IN CO/H_2 FISCHER-TROPSCH SYNTHESIS REACTIONS

Gary B. McVicker, Westfield, N.J., and M. Albert Vannice, Boalsburg, Pa., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 1, 1978, Ser. No. 882,328

Int. Cl.[2] B01J *21/18, 27/20, 23/78, 23/58*

U.S. Cl. 252—447 40 Claims

1. Supported, highly dispersed, high activity potassium or rubidium-Group VIII metal cluster catalysts demonstrating improved selectivity to olefinic and paraffinic hydrocarbons in CO/H_2 reactions prepared by the process which comprises depositing known, well-characterized potassium or rubidium-Group VIII metal carbonyl cluster complexes and mixtures thereof on a high surface area support material, drying the carbonyl cluster complex impregnated support in the absence of oxygen, and reducing the supported complex at elevated temperatures to effect the essentially complete reduction of the supported potassium or rubidium-Group VIII metal carbonyl cluster complexes to discrete potassium or rubidium-Group VIII clusters of metals on the support surface.

4,192,778

RARE EARTH EXCHANGE FAUJASITE ZEOLITE CATALYST CONTAINING SAME AND PROCESS FOR PRODUCING SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 808,268, Jun. 20, 1977, Pat. No. 4,164,483, which is a continuation-in-part of Ser. No. 718,166, Aug. 27, 1976, Pat. No. 4,085,069, and a continuation-in-part of Ser. No. 718,167, Sep. 8, 1976, Pat. No. 4,058,484. This application Jan. 16, 1978, Ser. No. 869,856

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z 14 Claims

1. A composition of matter comprising a zeolite of the faujasite type having in excess of 0.9 equivalents of rare earth cations per gram atom of aluminum in the zeolite and less than 0.1 equivalents of Na per gram atom of aluminum in the zeolite, the cation density composed of Na and rare earth being substantially equal to one equivalent per gram atom of the aluminum in the exchanged zeolite.

13. The process of exchanging a sodium faujasite type zeolite which comprises forming a water slurry of rare earth salts and a zeolite of the faujasite type having and a_o characteristic of zeolites of said type in which the ratio of the equivalents of rare earth cations per gram atom of aluminum in the zeolite being above about 1 and adjusting the pH of the mixture to be at a pH of about 5 to about 6 to form a reaction mixture and heating said adjusted mixture at a superatmospheric pressure and at a temperature of about 250 to 400 to introduce into the zeolite in excess of 0.9 equivalents of rare earth cation per gram atom of aluminum in the exchanged zeolite and washing the exchanged zeolite.

4,192,779

CATALYST SYSTEM AND METHOD FOR INCREASING THE SELECTIVITY OF A CATALYST

Haren S. Gandhi, Farmington Hills, Mich.; William L. Watkins, Toledo, Ohio, and Henryk K. Stepien, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 843,396, Oct. 19, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,415

Int. Cl.[2] B01J *23/42, 23/44, 23/64*

U.S. Cl. 252—470 7 Claims

1. A method for increasing the selectivity of a catalyst in transforming oxides of nitrogen to nitrogen rather than ammonia in which a catalyst system based upon (a) platinum, or (b) palladium, or (c) combinations of platinum and palladium, or (d) combinations of (a), (b), or (c) with other metal catalysts which are selective in transforming oxides of nitrogen to nitrogen rather than ammonia, is deposited on a support media as discreet particles in a finely divided state, which method comprises the step of:

providing on the support media molybdenum in a finely divided state, said molybdenum being present in an amount from at least one-half percent to about 20 percent by weight of the support media, but, in any event, said molybdenum being present by weight in an amount at least about seven times the weight of said platinum and/or palladium present.

4,192,780

METHOD OF MAKING LEAD-RICH AND BISMUTH-RICH PYROCHLORE COMPOUNDS USING AN ALKALINE MEDIUM AND A REACTION ENHANCING ANODIC POTENTIAL

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joseph T. Lewandowski, Middlesex, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 856,648, Dec. 2, 1977, Pat. No. 4,129,525. This application Nov. 1, 1978, Ser. No. 956,743

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 21 Claims

1. A method of preparing compounds having the formula:

$$A_2[B_{2-x}A_x]O_{7-y}$$

wherein A is selected from the group consisting of lead, bismuth and mixtures thereof, wherein B is selected from the group consisting of ruthenium, iridium and mixtures thereof, wherein x is a value such that $0 < x \leqq 1.0$ and y is a value such that $0 \leqq y \leqq 1$, comprising:

reacting A cations and B cations from an aqueous solution source of these cations in a liquid alkaline medium having a pH of at least about 10 in the presence of an oxygen source at a temperature below about 200° C., and in the presence of an anodic potential of at least about 1.0 volts vs. reversible hydrogen, for a sufficient time for reaction to occur.

4,192,781

PERFUMED ARTICLES CONTAINING CIS-OCT-6-EN-1-AL

Ferdinand Nlff, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 765,056, Feb. 2, 1977, Pat. No. 4,132,675. This application Aug. 10, 1978, Ser. No. 932,700

Claims priority, application Switzerland, Feb. 11, 1976, 164/576

Int. Cl.[2] A61K *7/46*

U.S. Cl. 252—522 R 2 Claims

1. A process for enhancing, improving or modifying the fragrance properties of perfumed articles selected from a cosmetic or a detergent which comprises the the step of admixing from 0.01% to 2% by weight of cis-oct-6-en-1-al in said perfumed articles.

4,192,782

USE OF CERTAIN SPIROPYRAN DERIVATIVES FOR AUGMENTING, ENHANCING OR MODIFYING THE ORGANOLEPTIC PROPERTIES OF PERFUMES AND COLOGNES

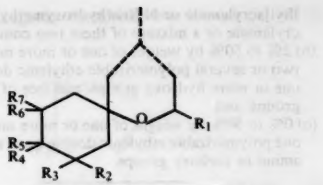
John B. Hall, Rumson; Denis E. Hruza, Sr., Brick Town, both of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Manfred H. Vock, Locust, and Joaquin F. Vinals, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 765,629, Feb. 4, 1977, which is a division of Ser. No. 701,249, Jun. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 547,057, Feb. 4, 1975, abandoned. This application Apr. 6, 1979, Ser. No. 27,790

Int. Cl.[2] A61K *7/16;* C11B *9/00*

U.S. Cl. 252—522 R 11 Claims

1. A perfume composition comprising (i) a perfume aroma augmenting or enhancing quantity of spiropyran derivative having the structure:



wherein R_1 is hydrogen or methyl; wherein R_2, R_3, R_4, R_5, R_6 and R_7 represents hydrogen or C_1–C_5 lower alkyl; wherein when one of R_2, R_3, R_4, R_5, R_6 or R_7 is any of C_2–C_5 lower alkyl, each of the other of the R_2, R_3, R_4, R_5, R_6 and R_7 moieties is hydrogen; wherein each of the dashed lines represents a carbon-carbon single bond or a carbon-carbon double bond, with at least one of the dashed lines being a carbon-carbon single bond and intimately admixed therewith at least one alcohol, aldehyde, nitrile, ester, cyclic ester or natural oil.

4,192,783

VEGETABLE BASED, REMOISTENABLE ADHESIVE FOR PREGUMMED TAPE

William A. Bomball, and Thomas G. Swift, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 490,478, Jul. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 344,658, Mar. 26, 1973. This application May 26, 1978, Ser. No. 909,855

Int. Cl.[2] C08L *89/00*

U.S. Cl. 260—8 8 Claims

1. A remoistenable adhesive composition suitable for use on pregummed substrates consisting essentially of a low viscosity starch-acrylamide graft copolymer, the starch of said copolymer being selected from the group consisting of waxy maize, waxy milo, tapioca and potato starches and having a cooked fluidity of 43–53 ml.; animal glue; and sufficient water to provide a solids content of 30–60%, and in which the weight ratio of said copolymer to animal glue is in the range of 9:1 to 1:9 dry substance basis.

3. An adhesive composition for remoistenable pregummed tape requiring open times greater than 20 seconds and tack times less than 2.5 seconds, consisting essentially of:

(a) at least 90% by weight of a derivatized, thinned, starch-acrylamide graft copolymer, the starch portion of said copolymer being selected from the group consisting of root and root-type starches and having a cooked fluidity in the range of 43–53 ml.;

(b) from 1–2.9% by weight of a hydrophilic substance for improving rewetting characteristics of said pregummed tape selected from the group consisting of carboxymethylcellulose, methyl ether of cellulose and hydroxyethyl cellulose; and

(c) from about 0.25–1.9% by weight of a partially hydroylzed polyvinyl alcohol for improving tack and rewet characteristics of said pregummed tape.

4,192,784

HYDROPHILIC COPOLYMERS, THEIR PREPARATION AND THEIR USE IN SEPARATION TECHNIQUES

Eric Brown, Le Mans; Egisto Boschetti, Chatou; Monique M. Corgier, Saint Quen, and Joël Touet, Le Mans, all of France, assignors to Mar-Pha Societe d'Etudes et d'Exploitation de Marques, Paris, France

Filed Jan. 27, 1978, Ser. No. 873,026

Claims priority, application France, Jan. 28, 1977, 77 02391

Int. Cl.[2] C08L *89/00, 3/00;* C08F *20/54*

U.S. Cl. 260—8 11 Claims

1. Water-insoluble, tridimensional cross-linked random copolymers resulting from the free radical polymerization of a mixture of monomers containing:

(a) 25% to 98% by weight of N-[tris(hydroxymethyl)me-

thyl]acrylamide or N-[tris(hydroxymethyl)methyl]methacrylamide or a mixture of these two compounds;

(b) 2% to 50% by weight of one or more monomers having two or several polymerizable ethylenic double bonds and one or more hydroxy groups, and free of NH_2 or COOH groups; and

(c) 0% to 50% by weight of one or more monomers having one polymerizable ethylenic double bond and one or more amino or carboxy groups.

4,192,785

OSTOMY ADHESIVE

James L. Chen, East Brunswick; Rudolfo D. Cilento, North Brunswick; John A. Hill, New Brunswick, and Anthony L. La Via, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 8, 1977, Ser. No. 804,673

Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.4 GC **7 Claims**

1. An adhesive composition for medicinal purposes consisting essentially of a substantially homogenous mixture on a percent weight basis of from about 15% to about 40% of guar gum, locust bean gum, or mixtures thereof; from 0% to about 25% of pectin, gum karaya, or mixtures thereof provided that the total amount of guar gum, locust bean gum, gum karaya and pectin is from about 20% to about 55%; from about 40% to about 60% of a mixture of a low molecular weight polyisobutylene having a viscosity average molecular weight of from about 36,000 to about 58,000 on the Flory scale and butyl rubber having a viscosity average molecular weight of from about 300,000 to about 450,000 on the Flory scale, said polyisobutylene and said butyl rubber combined in a ratio of from about 3 to 1 to about 5 to 1 on a weight basis; and as a cohesive strengthening agent from about 2% to about 12% of an inert natural or synthetic fibrous material or from about 10% to about 30% of a finely divided cellulose, a finely divided substantially water insoluble cross-linked dextran, a finely divided substantially water insoluble cross-linked sodium carboxymethylcellulose, or a finely divided substantially water insoluble starch-acrylonitrile graft polymer.

4,192,786

EPOXY RESIN COMPOSITION CONTAINING GLYCIDYL ETHER-METAL CARBOXYLATE CATALYST

Kyoichi Shibayama; Kazuo Okahashi, and Osamu Hayashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1978, Ser. No. 897,772

Claims priority, application Japan, Aug. 6, 1977, 52-94524

Int. Cl.[2] C08G *59/68, 59/42*

U.S. Cl. 260—18 EP **10 Claims**

1. An epoxy resin composition which comprises a mixture of 40–90 parts by weight of an epoxy resin having at least two epoxy groups per molecule; 70–100 parts by weight of an acid anhydride curing agent; and 60–10 parts by weight of the reaction product of the glycidyl ether of a monoalcohol and a metal carboxylate selected from the group consisting of the zinc, manganese, cobalt and nickel salts of octanoic acid, stearic acid, palmitic acid, naphthenic acid, caproic acid, enanthic acid, capric acid, myristic acid and lauric acid.

4,192,787

WATER BASED POLYVINYLCHLORIDE DISPERSION COATING COMPOSITION STABILIZED WITH IRON CARBOXYLATES

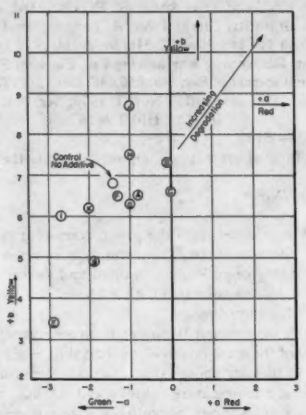
Howard J. Salmon, Cornwells Heights, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,348

Int. Cl.[2] C08L *91/00, 61/24, 61/26*

U.S. Cl. 260—21 **5 Claims**

1. A water-based coating formulation comprising powdered polyvinyl chloride or copolymers of vinyl chloride with other well-known vinyl monomers dispersed in a solution of water-dilutable acrylic resin having functional carboxyl groups, water-solubilized with ammonia, NH_4OH, or amine solubilizer, in water, a mixture of water and a monohydric alcohol or an



ether alcohol, or a mixture of water, a monohydric alcohol, and an ether alcohol, an aminoplast, and a minor amount of an iron carboxylate selected from the group consisting of iron naphthenate, iron neodecanoate, iron octoate, and iron tallate.

4,192,788

MODIFIED POLYETHYLENE CONTAINING HOT-MELT ADHESIVES USEFUL FOR CARPET TAPE

Daniel P. Dodson, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,330

Int. Cl.[2] C08L *93/00, 23/26*

U.S. Cl. 260—27 R **12 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of

(a) about 55 to 90 percent by weight of at least one modified polyethylene,

(b) about 5 to 25 percent by weight of at least one ethylene-lower alkyl acrylate copolymer, and

(c) about 5 to 30 percent by weight of at least one tackifier resin selected from the group consisting of hydrocarbon resin, polyterpene resin and rosin ester resin.

4,192,789

BLENDS OF ACRYLIC LATEXES AND DERIVATIVES OF ESTER DIOL ALKOXYLATES

Oliver W. Smith, South Charleston; Joseph V. Koleske, Charleston, and Robert J. Knopf, Saint Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 837,720, Sep. 29, 1977. This application Jan. 4, 1979, Ser. No. 884

Int. Cl.[2] C08J *3/00*

U.S. Cl. 260—29.2 E **6 Claims**

1. A high solids composition comprising a blend of an aqueous acrylic latex of from about 5 to about 50 weight percent, based on the total solids content of said latex, of an anhydride modified ester diol alkoxylate comprising the reaction product of (A) an ester diol alkoxylate of the general formula:

$$H(OC_mH_{2m})_xOC_nH_{2n}\overset{\overset{R}{|}}{C}C_nH_{2n}OOC\overset{\overset{R}{|}}{C}C_nH_{2n}O(C_mH_{2m}O)_yH$$

wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20 and R is an alkyl group having from 1 to 8 carbon atoms; and (B) an intramolecular anhydride of a polycarboxylic acid.

4,192,790

ELASTOMERIC COMPOSITION HAVING REDUCED MOONEY VISCOSITY

Paul H. McKinstry, and Robert R. Barnhart, both of Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 655,609
Int. Cl.[2] C08K 5/09
U.S. Cl. 260—31.2 MR **4 Claims**

1. A compounded elastomeric composition characterized by reduced Mooney viscosity comprising, in admixture, (A) 100 parts by weight of elastomer, (B) from 40 to 140 parts by weight of particulate inorganic filler and (C), from 0.1 to 7 parts by weight of finely divided particulate basic zinc methacrylate as an adjuvant, whereby the Mooney viscosity of the compounded elastomeric composition is reduced compared to the Mooney viscosity of an otherwise similar composition not containing the said basic zinc methacrylate adjuvant (C), the said elastomer being selected from the group consisting of natural rubber, cis-polybutadiene rubber, butadiene-styrene copolymer rubber, butadiene-acrylonitrile copolymer rubber, isoprene-isobutylene copolymer rubber, and unsaturated terpolymer of ethylene, propylene and a copolymerizable nonconjugated diene, wherein the said particulate inorganic filler (B) is selected from the group consisting of (i) silica filler (ii) a silicate filler and (iii) calcium cabonate filler.

4,192,791

HIGHLY EXTENDED, UNSATURATED POLYESTER RESIN SYRUP COMPOSITION MIXTURE CONTAINING BASIC ALUMINUM CHLORIDE, A SHAPED ARTICLE COMPRISED OF THE CURED, CROSS-LINKED COMPOSITION AND A PROCESS OF PREPARING SUCH ARTICLE

James M. Self, Taylor, S.C., assignor to Tanner Chemical Company, Inc., Greenville, S.C.

Filed Jun. 2, 1978, Ser. No. 911,758
Int. Cl.[2] C08K 3/22, 3/40
U.S. Cl. 260—40 R **30 Claims**

1. A highly extended, unsaturated polyester resin syrup composition mixture comprising:

(a) unsaturated polyester resin syrup composed of an unsaturated polyester resin and an ethylenically unsaturated copolymerizable monomer;

(b) basic aluminum chloride having the formula

$$AL_2(OH)_xCL_{6-x}$$

wherein x is 3, 4 or 5; and

(c) non-reinforcing extender material,

wherein the dry weight ratio of the sum of the extender material and the basic aluminum chloride to the resin syrup is from about 2.0:1.0 to about 8.5:1.0 and wherein the dry weight ratio of extender material to basic aluminum chloride is less than about 7.5:1.0.

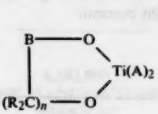
4,192,792

ATACTIC POLYPROPYLENE

Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Filed Jul. 20, 1978, Ser. No. 926,268
Int. Cl.[2] C08K 9/00
U.S. Cl. 260—42.14 **10 Claims**

1. A filled polymeric composition which comprises atactic polypropylene admixed with a comminuted inorganic material reacted with an organic, omega-alkylene titanate having the formula:



wherein A represents a non-hydrolyzable —OCOR', —O-SO_2R'', $(R''O)_2P(O)OP(OH)(O)$—, or $)R''O)_2P(O)O$— group; B is an R_2C group or a carbonyl group; R is hydrogen or an alkyl group having from 1 to 6 carbon atoms; R' and R'' are an alkyl, alkenyl, aryl, aralkyl or alkaryl group, or an alkyl, alkenyl, aryl, aralkyl, alkaryl, halo, ether, thioether, carbonyl or aromatic nitro substituted derivative thereof; and n is 1 or 2.

4,192,793

STABILIZERS FOR CHLORINE-CONTAINING RESINS

Katsuhiko Tanioka, Shiga; Toshihiko Matsuzawa; Noboru Iida, both of Otsu; Naoji Makino, and Itirow Hayasaka, both of Kawasaki, all of Japan, assignors to Sekisio Kagaku Kogyo Kabushiki Kaisha, Osaka and Shinagawa Chemical Industry Co., Ltd., Tokyo, both of, Japan

Division of Ser. No. 878,634, Feb. 17, 1978, Pat. No. 4,158,075, which is a continuation of Ser. No. 632,036, Nov. 14, 1975, abandoned. This application Dec. 5, 1978, Ser. No. 966,712
Int. Cl.[2] C08K 9/00
U.S. Cl. 260—42.14 **3 Claims**

1. A thermally stabilized chlorine-containing resin composition which comprises a chlorine-containing resin and a stabilizer which comprises calcium hydroxide coated with a calcium salt of an organic acid selected from the group consisting of saturated fatty acids having 10–22 carbon atoms and mixtures thereof.

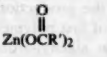
4,192,794

TITANIUM DIOXIDE-PIGMENTED POLYMER COMPOSITIONS HAVING IMPROVED VISIBLE AND ULTRAVIOLET LIGHT STABILITY

Richard H. S. Wang; Gether Irick, Jr., and James C. Ownby, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 3, 1978, Ser. No. 874,972
Int. Cl.[2] C08K 5/09, 5/27
U.S. Cl. 260—42.45 **8 Claims**

1. An ultraviolet light stabilized pigmented polyolefin polymeric composition comprising (1) a polyolefin polymeric composition normally susceptible to degradation due to visible or ultraviolet light, (2) titanium dioxide, (3) a phenolic ultraviolet stablizer and (4) 0.1 to 5 percent of a zinc salt of a carboxylic acid having the formula:



wherein R' is an alkyl group having 1 to 20 carbon atoms or an aryl group.

4,192,795

BARIUM ALUMINUM SILICATE FILLER FOR U.V. CURABLE COMPOSITES

Narayanan Madhavan, Dearborn Heights, and Frank H. Freeman, Farmington, both of Mich., assignors to Sybron Corporation, Rochester, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,787
Int. Cl.[2] C08K 3/40
U.S. Cl. 260—42.52 **2 Claims**

1. A U.V. curable dental restorative composition which consists essentially of a blend of BisGMA resin and about 50 to

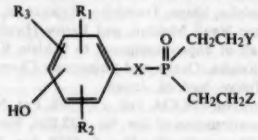
85 weight percent of an inorganic filler material which includes a barium-aluminum-silicate glass having the following composition in weight percent:
SiO_2: 25–40%
BaO: 35–55%
Al_2O_3: 15–30%.

4,192,796
POLYMERS STABILIZED WITH ORGANO-PHOSPHORUS COMPOUNDS

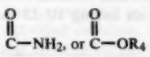
William L. Mosby, North Plainfield, and William B. Hardy, Bound Brook, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 26, 1979, Ser. No. 23,874
Int. Cl.[2] **C08K** *5/53, 5/50;* **C07C** *121/75, 103/26, 69/76*
U.S. Cl. 260—45.85 S **20 Claims**

1. A compound represented by the formula:



wherein R_1 and R_2 are each alkyl having 1 to 18 carbon atoms, R_3 is hydrogen or alkyl having 1 to 18 carbon atoms, X is 0 or $(CH_2)_n$ wherein n is an integer from 1 to 4, and Y and Z are each selected from CN,



wherein R_4 is alkyl having 1 to 18 carbon atoms.

20. A composition comprising a polymer normally subject to degradation by heat or ultraviolet light and an effective amount of a compound of claim 1.

4,192,797
SUSPENSION POLYMERIZATION

Michael Lederer, Königstein, Fed. Rep. of Germany, and Antonius J. M. Bouman, Oosterhout, Netherlands, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,433
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1976, 2628761
Int. Cl.[2] **C08F** *2/20*
U.S. Cl. 525—243 **6 Claims**

1. A process for the production of bead polymers which consists of the steps of first polymerizing an organic monomer phase comprising an alkenyl-aromatic compound having a monomer-soluble initiator dissolved thereby by suspension polymerization in an aqueous reaction medium in the presence of only water-soluble dispersing agents, to form polymer beads suspended in a mixture of said aqueous reaction medium and said organic monomer phase, separating the polymer beads from said mixture, adding to the mixture from 0 to 60% by weight of fresh water, based on the weight of aqueous reaction medium, from 0 to 70% by weight of the amount of water-soluble dispersing agent used in said first polymerization step, from 0.05 to 5% by weight, based on the weight of the organic monomer phase, of monomer-soluble initiator, and from 2 to 200 ppm, based on the weight of organic monomer phase, of a water-soluble initiator, and using the thus modified mixture as a reaction medium for polymerization of a further quantity of said alkenyl-aromatic compound.

4,192,798
RAPID, LARGE SCALE, AUTOMATABLE HIGH PRESSURE PEPTIDE SYNTHESIS

Michael S. Verlander, Del Mar; William D. Fuller, Lakeside, and Murray Goodman, La Jolla, all of Calif., assignors to BioResearch, Inc., Farmingdale, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,334
Int. Cl.[2] **C07C** *103/52*
U.S. Cl. 260—112.5 R **10 Claims**

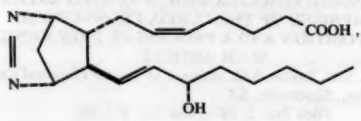
1. In the continuous flow method for the synthesis of a polypeptide chain on an insoluble solid support wherein a protected amino acid is passed in a continuous flow through a flow reactor packed with an insoluble solid support containing substituent groups reactive with said protected amino acid, and coupled to said support by condensation reaction with said reactive substituent groups, a second similar or dissimilar protected amino acid is passed through said reactor in a continuous flow and coupled to said first amino acid and the process repeated until the desired polypeptide is obtained, the improvement comprising conducting the reaction in said flow reactor under a pressure of at least 200 psi.

4,192,799
CONJUGATES FORMED BY REACTING A PROSTAGLANDIN MIMIC COMPOUND WITH A CARRIER MOLECULE

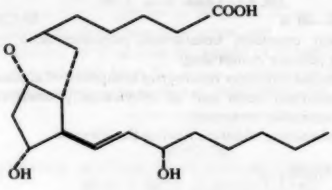
Francis A. Fitzpatrick, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 21, 1977, Ser. No. 835,352
Int. Cl.[2] **A61K** *37/02, 39/00*
U.S. Cl. 260—121 **18 Claims**

1. A conjugate formed by attaching to a carrier molecule which is a macromolecular immunogen of molecular weight greater than 2000 and less than 500,000, a compound selected from the group

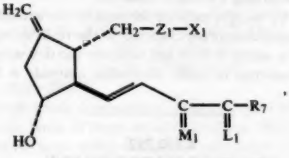


II



III

and



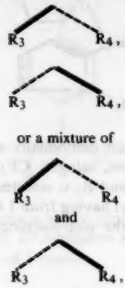
IV

wherein M_1 is

or

-continued

wherein R_5 is hydrogen or methyl; wherein L_1 is



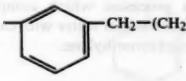
or a mixture of

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,

(9)



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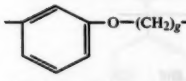


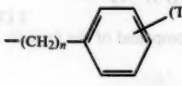
wherein g is one, 2, or 3;

wherein R_7 is

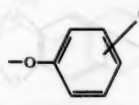
—$(CH_2)_m$—CH_3, (1)

(2)

(3)



wherein m is one to 5, inclusive; n is zero or one; T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive; and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and wherein X_1 is —$COOR_1$ wherein R_1 is hydrogen or a pharmacologically acceptable cation.

4,192,800

PROCESS FOR THE MANUFACTURE OF AROMATIC NITRILES

Raymond Price, and Nigel Hall, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

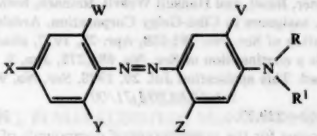
Filed Jul. 28, 1978, Ser. No. 929,198

Claims priority, application United Kingdom, Aug. 4, 1977, 32751/77

Int. Cl.[2] **C07C** *120/00;* **C09B** *43/00*

U.S. Cl. 260—205 **5 Claims**

1. A process for the manufacture of an azo dyestuff having the formula:



wherein

W represents a cyano group,

X and Y each independently represent a hydrogen atom, a halogen atom or a lower alkyl, lower alkyoxy, cyano, nitro, methylsulphonyl, ethylsulphonyl, unsubstituted carbamoyl, N-methylaminocarbonyl, N,N-dimethulaminocarbonyl, N-ethylaminocarbonyl, N,N-diethylaminocarbonyl, unsubstituted sulphamoyl, N-methylaminosulphonyl, N,N-dimethylaminosulphonyl, N-ethylaminosulphonyl, N,N-diethylaminosulphonyl or lower alkoxycarbonyl group,

Z represents a hydrogen atom or a lower alkyl, lower alkoxy or NHCO.T group in which T represents a phenyl or lower alkyl radical, amino group or a group NHQ in which Q represents a phenyl or lower alkyl radical,

V represents a hydrogen atom, a halogen atom or a lower alkyl or lower alkoxy group, and R and R^1 each independently represent a lower alkyl, cyclohexyl, benzyl, β-phenylethyl, phenyl, 2-cyanoethyl, 2-hydroxyethyl, 2-acetoxyethyl, 2-methoxycarbonylethyl or 2-ethoxycarbonylethyl group, which process comprises reacting the compound corresponding to said dyestuff in which W represents a chlorine, bromine or iodine atom, with formaldoxime in the presence of a copper catalyst selected from the group consisting of cupric acetate, cupric benzoate, cuprous chloride and cuprous iodide, and in the presence of an acid-binding agent, the reaction being carried out in a solvent selected from the group consisting of nitrobenzene, 2-nitrotoluene, dimethylformaminde and ethylene glycol monomethylether and at a temperature from normal room temperature up to 95° C.

4,192,801

NOVEL PHOSPHORANE INTERMEDIATES FOR USE IN PREPARING PENEM ANTIBIOTICS

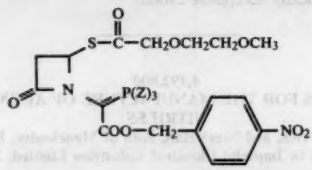
Yasutsugu Ueda, St. Lambert, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 900,466, Apr. 27, 1978. This application Nov. 16, 1978, Ser. No. 961,352

Int. Cl.[2] **C07D** *205/08*

U.S. Cl. 260—239 A **2 Claims**

1. A compound having the formula



wherein Z is phenyl or C_1–C_6 alkyl.

4,192,802

PROCESS FOR THE MANUFACTURE OF STEROID CARBOXYLIC ACID LACTONES

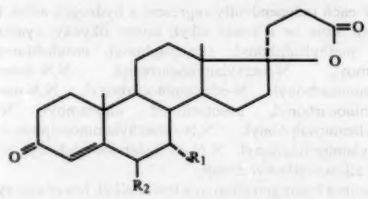
Georg Anner, Basel, and Hansuli Wehrli, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 791,438, Apr. 27, 1977, abandoned, which is a continuation of Ser. No. 694,275, Jun. 9, 1976, abandoned. This application Jul. 20, 1978, Ser. No. 926,357

Int. Cl.² C07J *71/00*

U.S. Cl. 260—239.57 **20 Claims**

1. A process for the manufacture of compounds of the formula



(I)

wherein R_1 and R_2 together represent a further 6,7—C—C bond, which comprises treating an acetal of 3β,17-dihydroxy-17α-pregn-5-en-21-carboxaldehyde in basic or neutral medium with a brominating agent selected from the group consisting of bromine and an organic bromine addition complex, oxidising the acetal of the 5,6-dibromo-3β,17-dihydroxy-17α-pregnan-21-carboxaldehyde obtained with a compound of hexavalent chromium under basic or neutral conditions, at temperatures between about −100 and about +30° C., treating the product so obtained with a member selected from the group consisting of a lithium halide in the presence of a basic alkali metal or alkaline earth metal salt and a nitrogen containing base of aromatic character at temperatures between about 0° and about +180° C., and subsequently treating the resultant acetal of 3-oxo-17β-hydroxy-17α-pregna-4,6-diene-21-carboxaldehyde in seccession or simultaneously with an acid and a compound of hexavalent chromium in acid solution.

4,192,803

5H-PYRROLO[2,1-c][1,4]BENZODIAZEPINE DERIVATIVES

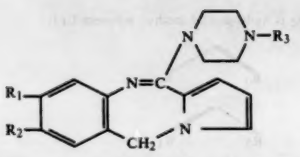
William B. Wright, Jr., Woodcliff Lake, and Robert A. Hardy, Jr., Ridgewood, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 15, 1978, Ser. No. 942,588

Int. Cl.² C07D *487/04;* A61K *31/55*

U.S. Cl. 260—243.3 **9 Claims**

1. A compound selected from the group consisting of those of the formula:



(I)

wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen, halogen, CF_3 and alkyl having from 1 to 4 carbon atoms and R_3 is selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms and β-hydroxyethyl; and the pharmacologically acceptable acid-addition salts thereof.

4,192,804

PROCESS FOR THE PURIFICATION OF MERCAPTOBENZOTHIAZOLE

Michel J. C. Alicot; René H. P. Rhode, both of Lannemezan, and Adrien P. N. Tignol, Montrejeau, all of France, assignors to Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle, Paris, France

Filed Jul. 6, 1978, Ser. No. 922,417

Claims priority, application France, Jul. 12, 1977, 77 21437

Int. Cl.² C07D *277/72*

U.S. Cl. 548—177 **7 Claims**

1. A process for the purification of mercaptobenzothiazole prepared according to known processes which comprises treating the crude product in the absence of water with carbon tetrachloride or with 1,1,2,2-tetrachloroethylene.

4,192,805

PROCESS OF PREPARING AMINO ETHANOLS

John T. Suh, Mequon, Wis., and Thomas M. Bare, West Chester, Pa., assignors to Nicholas International Limited, Melbourne, Australia

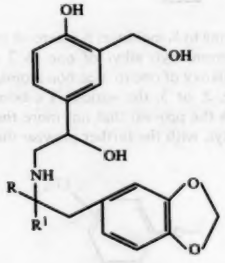
Continuation of Ser. No. 744,233, Nov. 23, 1976, abandoned. This application Sep. 8, 1978, Ser. No. 940,710

Claims priority, application United Kingdom, Nov. 27, 1975, 48710/75

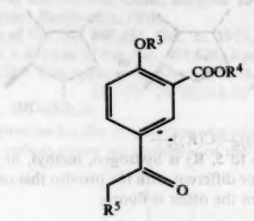
Int. Cl.² C07D *317/44*

U.S. Cl. 260—340.5 R **2 Claims**

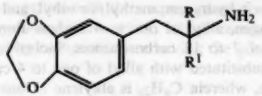
1. A process of preparing a compound of the formula



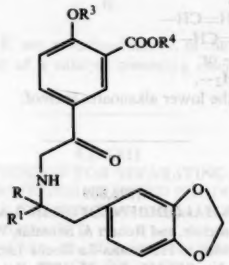
wherein R and R^1 each independently represent hydrogen or a C_1–C_4 alkyl group, which comprises (1) reacting a compound of the formula



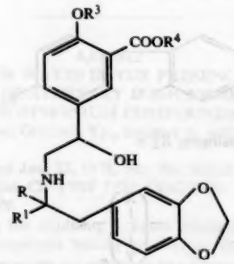
wherein R^3 represents a benzyl protecting group, R^4 represents an alkyl group, and R^5 represents a halogen atom in a solvent with a compound of formula



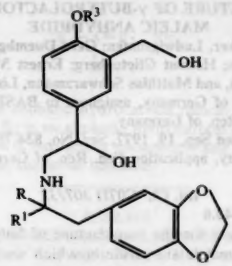
wherein R and R^1 have the meanings given above, to give a compound of formula



wherein R, R^1, R^3 and R^4 have the meanings given above, (2) reducing said latter compound with an alkali metal borohydride to obtain a compound of formula



wherein R, R^1, R^3 and R^4 have the meanings given above, (3) reducing said latter compound with a metal hydride to give a compound of formula



wherein R, R^1 and R^3 have the meanings given above, and (4) removing the protecting benzyl group by hydrogenation in the presence of a hydrogenation catalyst.

4,192,806

METHYL FUMARALDEHYDE MONOACETALS AND PROCESS

Joachim Paust, Neuhofen, and Horst Schumacher, Bobenheim am Berg, both of Fed. Rep. of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Fed. Rep. of Germany

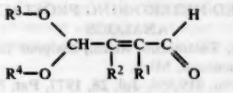
Continuation of Ser. No. 363,615, May 24, 1973, abandoned. This application Mar. 30, 1978, Ser. No. 891,540

Claims priority, application Fed. Rep. of Germany, May 26, 1972, 2225612

Int. Cl.[2] C07D *319/04*

U.S. Cl. 260—340.7 **9 Claims**

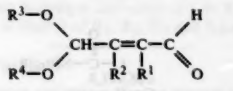
1. Cyclic methyl fumaraldehyde monoacetals of the formula I



I

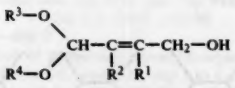
where R^1 and R^2 are different and denote hydrogen or methyl, and R^3 and R^4 together denote propylene or propylene having up to two C_{1-4} alkyl substituents.

7. A process for the production of methyl fumaraldehyde monoacetals of the formula I:



I

where R^1 and R^2 are different and denote hydrogen or methyl, and R^3 and R^4 together denote propylene or propylene having up to two C_{1-4} alkyl substituents, wherein a methyl derivative of the corresponding but-2-en-4-ol-1-al acetal of the formula II:



II

where R^1 to R^4 have the meanings given above is oxidized at temperatures of from −15° to +30° C. with a solution containing sulfuric acid and chromic acid in acetone.

4,192,807

MANUFACTURE OF γ-BUTYROLACTONE FROM MALEIC ANHYDRIDE

Franz J. Broecker, Ludwigshafen; Gerd Duembgen, Dannstadt-Schauernheim; Helmut Glietenberg; Ernest Miesen, both of Ludwigshafen, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,780

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642533

Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—343.6 **5 Claims**

1. In a process for the manufacture of butyrolactone by hydrogenating maleic anhydride in which water and, as by-products, succinic anhydride and succinic acid are formed, the improvement which comprises:

(a) continuously maleic anhydride and recycled or unconverted succinic anhydride over a fixed catalyst bed at a temperature below 210° C.,

(b) feeding the hydrogenated reaction mixture as a liquid into the upper part of a thin film evaporator at a temperature of not less than 235° C., wherein succinic acid is substantially decomposed to succinic anhydride and water, and a liquid phase containing products of low volatility and a vapor phase containing butyrolactone, succinic anhydride, water and any undecomposed succinic acid are formed,

(c) separating the products of low volatility as a liquid,

(d) conducting the vapor phase to a condensing means,

(e) partially condensing the vapor phase, wherein succinic anhydride and unconverted succinic acid are separated and recycled,

(f) conducting the non-condensed portion of the vapor phase from step (e) to a distillating means, and

(g) fractionally distilling said non-condensed portion and isolating the butyrolactone.

4,192,808

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

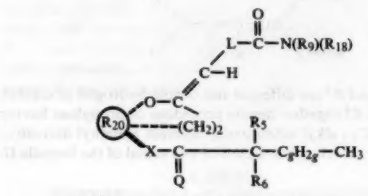
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,900

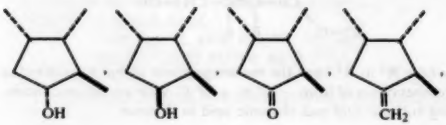
Int. Cl.[2] C07D *311/02*

U.S. Cl. 260—345.2 **17 Claims**

1. A 4Z compound of the formula



wherein (R_{20}) is



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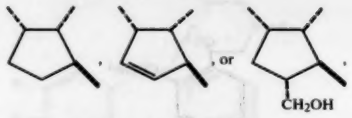
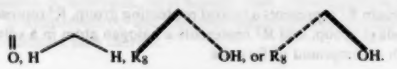


wherein L is $-(CH_2)_d-C(R_2)_2-$

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro,

wherein Q is



wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_9 is hydrogen, methyl, or ethyl, and wherein R_{18} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive, wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; aand

wherein X is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C— or

(4) $-CH_2CH_2-$;

including the lower alkanoates thereof.

4,192,809

CERTAIN 8-HALODIBENZOFURAN-3-ALKANOLS

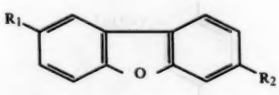
Leo Berger, Montclair, and Robert A. Schmidt, Wallington, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 763,446, Jan. 27, 1977, Pat. No. 4,097,497, which is a division of Ser. No. 548,658, Feb. 10, 1975, Pat. No. 4,022,805, which is a continuation-in-part of Ser. No. 448,853, Mar. 7, 1974, abandoned. This application Apr. 7, 1978, Ser. No. 894,282

Int. Cl.[2] C07D *307/91*

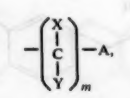
U.S. Cl. 260—346.71 **5 Claims**

1. A compound of the formula



I

wherein R_1 is halogen; R_2 is



wherein A is hydroxy; X and Y, independently, are hydrogen or lower alkyl, and m is 1 to 7; or when X and Y are different, its enantiomers.

4,192,810
PREPARATION OF VICINAL EPOXIDES

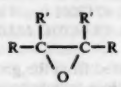
Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 845,183, Oct. 25, 1977, Pat. No. 4,111,965, which is a division of Ser. No. 459,628, Apr. 10, 1974, Pat. No. 4,069,234. This application Aug. 17, 1978, Ser. No. 934,667

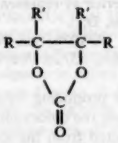
Int. Cl.[2] C07D *301/02*

U.S. Cl. 260—348.16 **8 Claims**

1. A process for the preparation of a vicinal epoxide having 2 to 30 carbon atoms per molecule of the general formula



wherein each R and each R′ are individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having 1 to 10 carbon atoms and wherein both R′ radicals in said epoxide can represent a divalent aliphatic hydrocarbon radical which together with the oxirane group in said epoxide can form a cycloaliphatic nucleus, which comprises heating the corresponding carbonate ester having the general formula



wherein R and R′ are as defined above, in the presence of a catalytic amount of a catalyst consisting essentially of zinc benzoate.

4,192,811
PROCESS FOR SEPARATING STIGMASTEROL-DERIVED PRODUCTS

Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1979, Ser. No. 20,896

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.25 **5 Claims**

1. A process which comprises treating a crude mixture of sterols containing stigmasterol to form the i-methyl ethers of said sterols, ozonizing the mixed phytosterol i-methyl ethers, reducing the phytosterol ozonide to form 6-β-methoxy-3α,5α-cyclodinorcholanaldehyde and the i-methyl ethers of stigmasterol and campesterol.

4,192,812
OXIDATION OF WAXES IN THE PRESENCE OF LONG CHAIN QUATERNARY AMMONIUM AND PHOSPHONIUM COMPOUNDS

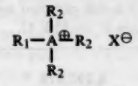
Donald D. Carlos, Grayson, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 22, 1978, Ser. No. 918,131

Int. Cl.[2] C09F *7/02*; C11C *3/00*

U.S. Cl. 260—406 **7 Claims**

1. A process for oxidizing a liquid mixture of saturated paraffinic hydrocarbons having an average of about 20 to about 100 carbon atoms per molecule to a desired acid number comprising blowing an oxidizing gas through said liquid mixture in the presence of an oxidizing catalyst and a promoting amount of a quaternary salt having the formula:



where R_1 is an aliphatic hydrocarbon radical of 12 or more carbon atoms, R_2 is an aliphatic hydrocarbon radical of 1–12 carbon atoms, A is nitrogen or phosphorus and $X^{\oplus}$ is chloride, bromide, iodide, sulfate or bisulfate.

4,192,813
OMEGA-HYDROXY ALKENOIC ACID

Francesco Siclari, Barlassina Milan, Italy, assignor to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Division of Ser. No. 486,992, Jul. 10, 1974, Pat. No. 4,085,127. This application Mar. 13, 1978, Ser. No. 885,537

Claims priority, application Italy, Jul. 11, 1973, 26479 A/73

Int. Cl.[2] C11C *3/02, 1/00*

U.S. Cl. 260—410.9 R **2 Claims**

1. Omega hydroxy alkenoic acids containing 8 and 12 carbon atoms, respectively, and selected from the group consisting of 12-hydroxy-dodecane-t,t-4,8-dienoic acid, 8-hydroxy-cis-4-octenoic acid and esters thereof.

2. An ester as defined in claim 1, comprising the methyl ester of said 12-hydroxy-dodecane-t,t-4,8-dienoic acid.

4,192,814
PROCESS FOR CATALYTIC CONVERSION OF THALLIUM (I) TO THALLIUM (III)

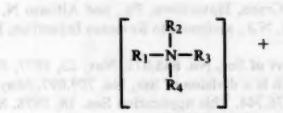
Richard A. Johnson, Midland Park, N.J., assignor to Halcon Research & Development Corporation, New York, N.Y.

Filed May 30, 1978, Ser. No. 910,309

Int. Cl.[2] C07F *5/00*

U.S. Cl. 260—429 R **9 Claims**

1. A process for converting a thallium (I) compound to a thallium (III) compound which comprises reacting the thallium (I) compound in a liquid medium with molecular oxygen in the presence of a Group VIII noble metal catalyst and in the presence of a promoter comprising at least one alkyl ammonium salt possessing a moiety having the formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting hydrogen and alkyl of 1 to 20 carbon atoms, provided that at least 2 of R_1, R_2, R_3 and R_4 are alkyl.

4,192,815
METHOD OF PREPARING ISOCYANATES

Viktor D. Sheludyakov, ulitsa Metallurgov, 32, korpus 1, kv. 22, Moscow; Alexei D. Kirilin, VUGI, 9, kv. 23, Ljubertsy Moskovskoi; Vladimir F. Mironov, ulitsa Gubkina 4, kv. 13, Moscow; Sergei N. Glushakov, ulitsa Lenina 55, kv. 20, and Yakov S. Karpman, ulitsa Lenina 55, kv. 32, both of Moskovskaya, all of U.S.S.R.

Filed Jun. 22, 1978, Ser. No. 918,824

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P **7 Claims**

1. A method of preparing organic isocyanates comprising interaction of primary amines having 1 to 6 carbon atoms and carbon dioxide with hexamethyldisilazane in the presence of an acidic catalyst selected from mineral acids, organic acids or salts thereof, sulfocationites or phosphoric acid cationites, at a temperature within the range of from 40° to 200° C. and subse-

quent decomposition of the resulting silyl esters of carbamic acid in the presence of a dehydration agent at a temperature within the range of from 0° to 350° C.

4,192,816

MIXTURES OF 3-PENTENENITRILES AND 3-METHYLENE-PENTANENITRILES

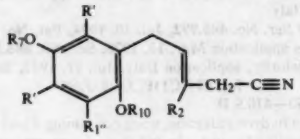
Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 873,184, Jan. 30, 1978, abandoned. This application Dec. 15, 1978, Ser. No. 970,037

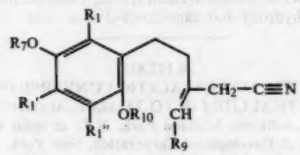
Int. Cl.[2] **C07C** *121/70;* **C07D** *311/72*

U.S. Cl. 260—465 D **2 Claims**

1. A mixture of a compound of the formula



and a compound of the formula:



wherein R_1, R_1' and R'' are hydrogen or lower alkyl; R_7 is lower alkanoyl, benzoyl or toluoyl; R_2 is lower alkyl; R_9 is hydrogen or lower alkyl containing from 1 to 6 carbon atoms, and R_{10} is lower alkanoyl or benzoyl.

4,192,817

AMPHOTERIC SURFACTANTS

Saul Kaplan, Teaneck; John J. Merianos, Jersey City, both of N.J.; Harold A. Green, Havertown, Pa., and Alfonso N. Petrocci, Glen Rock, N.J., assignors to Kewanee Industries, Inc., Bryn Mawr, Pa.

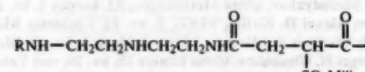
Continuation-in-part of Ser. No. 848,071, Nov. 23, 1977, Pat. No. 4,133,772, which is a division of Ser. No. 799,697, May 23, 1977, Pat. No. 4,076,744. This application Sep. 18, 1978, Ser. No. 943,376

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.[2] **C07C** *143/02;* **A01N** *9/20*

U.S. Cl. 260—513 N **4 Claims**

1. An antimicrobial compound made by reacting a compound of formula



with an approximately equimolar quantity of sodium chloroacetate while adding sodium hydroxide at a rate which keeps the pH of the reaction mixture approximately between 6.5 and 8.5 until the reaction is substantially complete, R being a normal alkyl group of from 8 to 18 carbon atoms and M''' and M^{IV} being the same or different and selected from the group consisting of hydrogen, alkalai metals, ammonium and ammonium substituted by from 1 to 3 lower alkyl groups, said lower alkyl groups being optionally substituted by one hydroxyl group.

4,192,818

COMPOUNDS HAVING PHARMACOLOGICAL PROPERTIES

Jan van Dijk, and Jenkin E. Davies, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Amsterdam, Netherlands

Division of Ser. No. 517,519, Oct. 24, 1974, Pat. No. 3,937,841, which is a division of Ser. No. 279,971, Aug. 11, 1972, abandoned, which is a division of Ser. No. 715,571, Mar. 25, 1968, Pat. No. 3,692,835. This application Dec. 10, 1975, Ser. No. 639,571

Claims priority, application Netherlands, Apr. 5, 1967, 6704810; Dec. 14, 1967, 6717001

Int. Cl.[2] **C07C** *131/00*

U.S. Cl. 260—566 AE **3 Claims**

1. A compound selected from the group consisting of O-(2-amino-ethyl)-4'-methylthioacetophenone oxime and O-(2-amino-ethyl)-4'-methylthiohexanophenone oxime and the salts thereof with pharmaceutically acceptable acids.

4,192,819

METHOD FOR PRODUCING HYDRAZINES BY REACTING CHLORAMINE WITH AMMONIA OR AMINES

Robert E. Farncomb, Accokeek; Kurt F. Mueller, Oxon Hill, and Kerry L. Wagaman, Clinton, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1978, Ser. No. 934,782

Int. Cl.[2] **C07C** *85/26, 109/02, 109/04*

U.S. Cl. 260—583 N **16 Claims**

1. In the method of producing hydrazines by generating chloramine, then reacting the chloramine with a nitrogen-containing compound selected from the group consisting of ammonia, monomethylamine, and dimethylamine, and finally isolating and purifying the hydrazine product, improved means for reacting the chloramine with the nitrogen containing compound comprising:

(1) preparing a two-phase system of;

(a) an upper storage layer comprising a solution of the nitrogen-containing compound, and

(b) a lower reaction layer comprising an aqueous caustic solution having a concentration which ranges from more than zero weight percent caustic up to saturated;

(2) dissolving the solution of nitrogen-containing compound into said reaction layer until equilibrium saturation is attained;

(3) introducing chloramine into the lower reaction layer of the two-phase system at a rate such that the chloroamine reacts with the nitrogen-containing compound which is available in the reaction layer so as to form the desired hydrazine before the chloramine can reach the storage layer;

(4) agitating the two-phase system so as to facilitate the transfer of the hydrazine product from the reaction layer to the storage layer, wherein this agitation is performed simultaneously with step (3), and provided that the agitation is gentle enough that the storage layer is not brought into contact with the chloramine.

4,192,820

PREPARATION OF 3-METHYL-2-BUTEN-1-AL

Bernd Meissner, Heidelberg; Werner Fliege, Otterstadt; Otto Woerz, Ludwigshafen; Christian Dudeck, Limburgerhof, and Hans Diehm, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,016

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715208

Int. Cl.[2] **C07C** *47/02*

U.S. Cl. 260—601 R **10 Claims**

1. A process for the preparation of 3-methyl-2-buten-1-al which comprises isomerizing the unsaturated compound 3-

methyl-3-buten-1-al at from 50° to 250° C. in the presence of an isomerization catalyst selected from the group consisting of strong acids having acid exponents (pKa) of from −7 to +2.16, and tertiary amines, alkaline earth metal compounds, alkali metal compounds, ammonium compounds and tertiary phosphines as basic compounds.

4,192,821

PURIFICATION OF CRUDE MONOCHLOROMETHANE GAS

Reinhold Gräser, Frankfurt am Main; Wilhelm Lendle, Bad Soden am Taunus, and Hendrik W. Post, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,382

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658132

Int. Cl.[2] C07C *19/00*

U.S. Cl. 260—652 P **4 Claims**

1. A process for the elimination of dimethylether from crude monochloromethane, consisting essentially of monochloromethane and dimethylether which comprises washing the crude monochloromethane with aqueous hydrochloric acid of a concentration greater than 35%.

4,192,822

PROCESS FOR PRODUCING HALOGENATED HYDROCARBONS

Richard F. Sweeney, Elma, and Bernard F. Sukornick, Williamsville, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 843,759, Oct. 20, 1977, Pat. No. 4,145,368. This application Feb. 2, 1979, Ser. No. 8,898

Int. Cl.[2] C07C *19/08*

U.S. Cl. 260—653 **13 Claims**

1. A process for producing halogenated hydrocarbons of 1 or 2 carbons which comprises reacting a chlorine-donating perhalogenated hydrocarbon selected from the group consisting of carbon tetrachloride, trichloromonofluoromethane, dichlorodifluoromethane, hexachloroethane, pentachloromonofluoroethane, tetrachlorodifluoroethane and trichlorotrifluoroethane with a hydrogen-donating halogenated hydrocarbon selected from the group consisting of trifluoromethane, difluoromethane, methyl fluoride, chlorodifluoromethane, dichloromonofluoromethane, methyl chloride, methylene chloride, chloroform, monochloromonofluoromethane, ethyl chloride, ethyl fluoride, monochloromonofluoroethane, dichloroethane, difluoroethane, trichloroethane, trifluoroethane, monochlorodifluoroethane, dichloromonofluoroethane, tetrachloroethane, trichloromonofluoroethane, dichlorodifluoroethane, monochlorotrifluoroethane and tetrafluoroethane in the presence of a catalyst selected from the group consisting of chromium oxides and oxyfluorides and activated carbon and recovering a first halogenated hydrocarbon product which is said hydrogen-donating halogenated hydrocarbon with one less hydrogen and one more chlorine and a second halogenated hydrocarbon product which is said chlorine-donating perhalogenated hydrocarbon with one more hydrogen and one less chlorine.

4,192,823

VAPOR PHASE CHLORINATION OF 1,1-DICHLOROETHANE

Walker H. Rideout, and John D. Mansell, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1978, Ser. No. 883,610

Int. Cl.[2] C07C *17/00*

U.S. Cl. 260—658 R **4 Claims**

1. In a process for the production of methylchloroform wherein chlorine and 1,1-dichloroethane are reacted under conditions of temperature and pressure sufficient to maintain the reactants in the vapor phase, the improvement comprising conducting said vapor phase reaction between chlorine and 1,1-dichloroethane in the presence of a controlled quantity of carbon dioxide in an amount of from at least about 500 to about 10,000 parts per million parts of chlorine and 1,1-dichloroethane to obtain a reaction product having a higher mole percentage of methylchloroform than that obtained were the reaction conducted in the absence of carbon dioxide under the same conditions of temperature and pressure, and at the same reactants ratio.

4,192,824

AROMATIC HYDROCARBON RESINS

Joseph G. Robinson, Winchcombe, and David I. Barnes, Cheltenham, both of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 834,995, Sep. 20, 1977, abandoned. This application Jan. 9, 1979, Ser. No. 2,173

Claims priority, application United Kingdom, Sep. 23, 1976, 39707/76; May 10, 1977, 19552/77

Int. Cl.[2] C07C *5/14, 15/28*

U.S. Cl. 585—409 **9 Claims**

1. A method or producing an aromatic hydrocarbon-carbonyl compound condensation product, consisting essentially of the step of reacting at a temperature of from 5 ° to 90° C. in the presence of aluminum chloride or bromide a mixture containing as reacting components only a mono- or bi-nuclear aromatic hydrocarbon selected from the group consisting of toluene, naphthalene, xylene, alkylbenzene, polyalkyl benzene, alkyl naphthalene and polyalkyl naphthalene wherein the alkyl group is not highly branched and contains up to six carbon atoms and a carbonyl compound having more than one carbon atom.

4,192,825

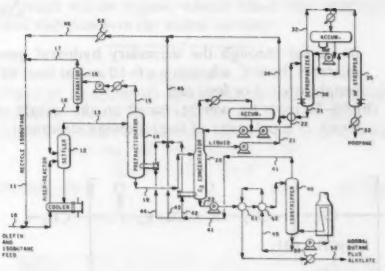
ENERGY EFFICIENT ALKYLATION PROCESS

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1978, Ser. No. 922,478

Int. Cl.[2] C07C *3/54*

U.S. Cl. 585—719 **12 Claims**



1. An alkylation process which comprises:

contacting an olefin and isoparaffin in the presence of an HF acid-alkylation catalyst under alkylation conditions to form an alkylation effluent comprising alkylate, isoparaffin, and acid catalyst,

separating said effluent into an acid catalyst phase and hydrocarbon phase,

passing said hydrocarbon phase to a fractionator wherein said hydrocarbon phase is separated into at least two fractions with a first fraction being a substantially HF free fraction which is passed to a propane concentration zone to thereby increase the concentration of propane in the feed stream to be sent to a depropanizer and a second fraction being an acid-catalyst rich overhead fraction,

feeding the propane-rich fraction obtained from said pro-

pane concentration zone to a depropanizer from which purified propane is recovered,

feeding a bottom fraction from said propane concentration zone to an isostripper thereby yielding an overhead vapor stream and a bottoms stream,

passing in indirect heat exchange relationship at least one of said overhead vapor stream or said bottoms stream from the isostripper with at least one of said feed stream to said isostripper or as a heat source to said fractionation zone, thereby conserving energy by maximizing the use of available heat energy.

4,192,826

THERMOSETTING, ELECTROSTATICALLY SPRAYABLE COMPOSITIONS CONTAINING BLOCKED ACID CATALYST

Aleksander Beresniewicz, Wilmington, Del., and John P. Gallagher, Philadelphia, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 704,365, Jul. 12, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,363

Int. Cl.[2] **C08L** *67/02*

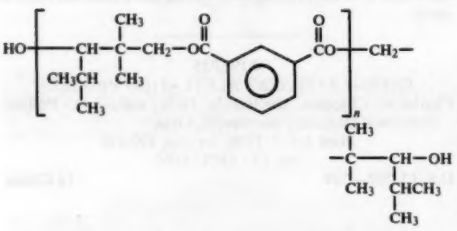
U.S. Cl. 525—425 **4 Claims**

1. A thermosetting liquid electrostatically sprayable composition consisting essentially of:

(A) film forming constituents consisting essentially of:

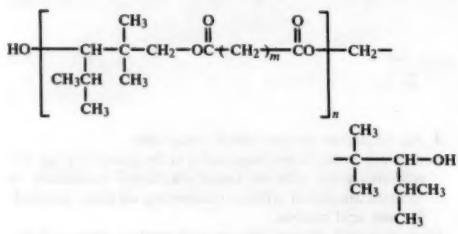
(1) 50–80 parts, by weight of the film formers, of an ester blend consisting essentially of:

(a) 40–80 parts by weight, based on the weight of the blend, of a polyester of the following structure:



its isomer through the secondary hydroxyl group of mixtures thereof, wherein n=0–10 and at least 65% by weight is n=3 or less; and

(b) 60–20 parts by weight, based on the weight of the blend, of a polyester of the following structure:



its isomer through the secondary hydroxyl group or mixtures thereof, wherein n=0–10 and at least 65% by weight is n=3 or less and wherein m=2–4; and

(2) 50–20 parts, by weight of the film formers, of peralkoxymethylmelamine; and

(B) sufficient blocked acid catalyst to contain 0.05–2 parts, by weight of the film formers, of potentially available sulfonic acid, wherein the blocked catalyst is the reaction product of a material containing at least one oxirane functionality and a sulfonic acid is an equivalent ratio of at least one; and

wherein the composition has a resistivity of at least 1 megohm and up to 3.5 megohms.

4,192,827

WATER-INSOLUBLE HYDROPHILIC COPOLYMERS

Karl F. Mueller, New York, and William R. Good, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 581,065, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 483,743, Jun. 27, 1974, abandoned. This application Mar. 3, 1978, Ser. No. 883,022

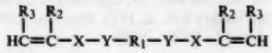
Int. Cl.[2] **C08L** *75/00;* **C08G** *73/12*

U.S. Cl. 525—123 **17 Claims**

1. A water-insoluble hydrophilic gel comprising the cross-linked copolymerization product of

(A) about 30 to about 90% by weight of said gel of (a) a water-soluble monoolefinic monomer, or mixture of said monomers, or (b) a water-soluble monomer, or mixture of said monomers, with 1 to 50% by weight of total monomers of a water-insoluble monoolefinic monomer, or mixture of said water-insoluble monomers, with

(B) about 10 to about 70% by weight of said gel of a terminal diolefinic hydrophobic macromer having a molecular weight from about 400 to about 8000, said macromer having the formula



wherein R_1 is a polycondensate chain having a molecular weight from about 200 to about 8000, which is the residue of a poly(propylene oxide) or poly(tetramethylene oxide) glycol having ether linkages; R_2 is hydrogen, methyl or $—CH_2COOR_4$, wherein R_4 is hydrogen or an alkyl group with up to 10 carbon atoms; R_3 is hydrogen or $COOR_4$, with the proviso that at least one of R_2 and R_3 is hydrogen; X is oxa, —COO—, or $—CONR_5—$ is hydrogen or alkyl with up to 5 carbon atoms and Y is a direct bond or the radical $—R_6—Z_1—CO—NH—R_7—NH—CO—Z_2—$, wherein R_6 is linked to X and represents branched or linear alkylene with up to 7 carbon atoms; Z_1 and Z_2 is oxa or NR_5 and R_7 is the diradical of an aliphatic or aromatic diisocyanate, with the proviso that in case X is oxa, Y is different from a direct bond, and R_2 and R_3 are hydrogen.

4,192,828

POLYMER COMPOSITIONS HAVING ENHANCED LOW TEMPRATURE IMPACT RESISTANCE ON AGEING

Gilbert Witschard, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 881,949, Feb. 28, 1978. This application Mar. 31, 1978, Ser. No. 892,226

Int. Cl.[2] **C08L** *53/02, 57/08*

U.S. Cl. 525—83 **15 Claims**

1. In a vinyl halide-graft-hydrocarbon polyolefin polymer composition capable of being molded to an impact resistant article, the improvement wherein the composition comprises a block thermoplastic elastomer wherein the major proportion of the monomer units are residues of a mono-alkenyl arene of the benzene or naphthalene series of 8 to 20 carbon atoms and a conjugated alkadiene hydrocarbon of 4 to 10 carbon atoms, the proportion of block elastomer being about 1% to 20% based on the combined weight of the graft polymer and the block elastomer.

4,192,829
UNSYMMETRICAL O-ALKYL S'-BUTYL S-ALKYLTHIOALKYL DITHIOPHOSPHATES AND OXIDIZED DERIVATIVES THEREOF

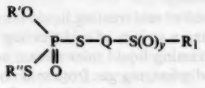
Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 677,719, Apr. 16, 1976, Pat. No. 4,075,332, which is a continuation of Ser. No. 505,109, Jul. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 210,229, Dec. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 173,267, Aug. 19, 1971, abandoned, and Ser. No. 821,117, May 1, 1969, abandoned. This application Feb. 17, 1978, Ser. No. 878,879

Int. Cl.² C07F 9/165

U.S. Cl. 260—948 **16 Claims**

1. A compound of the general formula:



wherein R' is methyl or ethyl; R" is isobutyl; R_1 to C_1 to C_4 alkyl or C_1 to C_4 substituted alkyl; Q is a C_1 to C_4 alkylene radical; and y is 0 to 2.

4,192,830
HALOGENATED PHOSPHONITRILIC ESTERS

Rainer Wolf, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

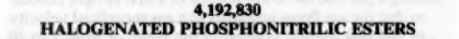
Filed Jul. 3, 1978, Ser. No. 921,551

Claims priority, application Switzerland, Jul. 7, 1977, 8421/77; Jul. 7, 1977, 8422/77

Int. Cl.² C07F 9/02

U.S. Cl. 260—973 **10 Claims**

1. In a process for producing halogenated phosphonitrilic esters comprising reacting one or more phosphonitrilic halides of formula II,



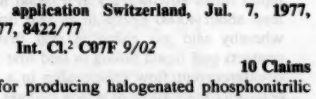
II

in which

q is an integer 3 to 12, and

Hal is fluorine, chlorine or bromine,

with one or more alcohols selected from the group consisting of those of formula III,



III

and those of formula IV,

IV

in which each of

R_1, R_2 and R_3, independently, is halogenated lower alkyl, in the presence of an acid binding agent, the improvement wherein the acid binding agent comprises one or more alkaline earth metal oxides or a mixture of one or more alkaline earth metal oxides and up to 80% by weight of said mixture, of one or more alkali metal hydroxides, the total number of mols of said alkaline earth metal oxides and alkali metal hydroxides being equal to at least half the number of hydroxyl groups present in said alcohol(s).

4,192,831
MANUFACTURE OF SALTS OF O,S-DITHIOPHOSPHORIC ACIDS

Karl Kiehs, Lampertheim, and Hans Theobald, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

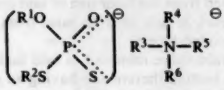
Continuation-in-part of Ser. No. 655,457, Feb. 5, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 836,062

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1975, 2506618

Int. Cl.² C07F 9/165

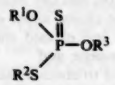
U.S. Cl. 260—987 **7 Claims**

1. A process for the manufacture of a salt of an O,S-dithiophosphoric acid diester of the formula:



where R^1, R^2 and R^6 independently of one another denote an organic radical, R^3, R^4 and R^5 independently of one another denote hydrogen or an organic radical, and R^5 and R^6 together with the nitrogen atom whose substituents they are may form a heterocyclic ring, which process comprises:

reacting an O,O,S-dithiophosphoric acid derivative of the formula:



where R^1 and R^2 have the above meanings and R^3 denotes an organic radical,

with an amine of the formula:

$$NR^4R^5R^6$$

where R^4, R^5 and R^6 have the above meanings, said reaction being carried out in a solvent medium consisting essentially of water or water and an organic solvent which both dissolves in water and also dissolves the amine reactant.

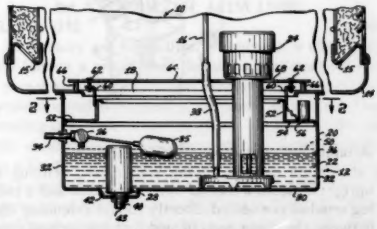
4,192,832
AUTOMATIC FLUSHING AND DRAINING RESERVOIR APPARATUS FOR EVAPORATIVE COOLERS

Adam D. Goettl, 4960 E. Palomino Rd., Phoenix, Ariz. 85018

Filed Jan. 29, 1979, Ser. No. 7,027

Int. Cl.² B01F 3/04

U.S. Cl. 261—36 R **11 Claims**



1. An automatic flushing and draining reservoir for an evaporative cooler comprising:

(a) an evaporative cooler including a water distribution plumbing system for carrying water to the upper portion of said cooler and a floor pan for receiving unevaporated

water draining by gravity from the upper portion of said cooler, the floor pan of said cooler having an opening formed therethrough;

(b) a tank mounted on the bottom of said cooler below the opening of the floor pan thereof for receiving the unevaporated water from the floor pan;

(c) means for supplying water from an external source to said tank and maintaining it at a predetermined operating level therein;

(d) pump means for pumping water from said tank into the distribution plumbing system of said cooler and allowing the pumped water in the distribution plumbing system to drain back by gravity into said tank upon interruption of the operation of said pump means so that this returning pumped water in conjunction with the unevaporated water received from the floor pan of said cooler will cause the water level in said tank to raise from the operating level to a flooded level;

(e) a siphon drain valve mounted in said tank with its inlet adjacent the bottom thereof and having an elevated water passage zone located between the water operating level and the flooded water level of said tank so that its siphoning action will be initiated upon the water level in said tank reaching the flooded level, said siphon drain valve including,

I. a standpipe mounted in the bottom of said tank and having an open upper end, and

II. a cylindrical cap having a closed upper end and an inside diameter which is larger than the outside diameter of said standpipe, said cap mounted coaxially on said standpipe with the closed upper end of said cap spaced above the upper end of said standpipe to define the elevated water passage; and

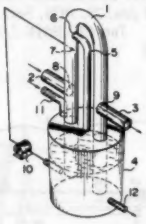
(f) said tank being sized to contain said means for supplying water, said pump means, said siphon drain valve and hold a sufficient amount of water for proper operation of said evaporative cooler as determined by the size of said evaporative cooler.

4,192,833

LIQUID-GAS CONTACTOR AND LIQUID-GAS CONTACT PROCESS

Noboru Hashimoto; Hideo Fukuda, and Setsuo Shibata, all of Yokohama, Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Jan. 9, 1978, Ser. No. 867,966
Claims priority, application Japan, Jan. 17, 1977, 52/2917
Int. Cl.[2] B01D *47/02, 47/06*
U.S. Cl. 261—36 R **21 Claims**



1. A liquid-gas contactor, which comprises:

an absorption column having wall means defining a first upright conduit, a second upright conduit and a connecting conduit connected directly to and extending directly between the upper ends of said first and second conduits, said first upright conduit, said second upright conduit and said connecting conduit collectively defining an inverted U-shape flow path;

gas inlet means communicating with said first upright conduit and located thereon at a position close to the lower end thereof whereby gas to be treated is fed into said first upright conduit;

treating liquid inlet means communicating with said first upright conduit and located thereon at a position which is upwardly spaced from said gas inlet means whereby treating liquid is fed into said first upright conduit for contact with the gas fed in through said gas inlet means;

a closed tank which is partially filled with a bath of said treating liquid, said tank having an upper wall, the space between the upper surface of said treating liquid in said tank and said upper wall defining a gas chamber, the lower end of said first upright conduit communicating with said tank below the upper surface of said bath of treating liquid and opening into said bath so that treating liquid that flows downwardly through said first upright conduit flows into said bath of treating liquid, the lower end of said second upright conduit extending into said tank and opening thereinto;

a pump connected to said treating liquid inlet means and said tank for feeding a stream of said treating liquid from said tank to said treating liquid inlet means; and

a gas outlet for discharging gas from said contactor, said gas outlet being connected to said second upright conduit adjacent the lower end thereof above the upper surface of the treating liquid in said tank.

10. A liquid-gas contact process, which consists essentially of the steps of:

feeding a gas into the lower portion of a first upright conduit so that the gas flows upwardly at a gas superficial velocity in said first upright conduit in the range of from 5 to 20 m/sec and simultaneously flowing a treating liquid into the upper portion of said first upright conduit so that the liquid flows downwardly at a liquid mass velocity of at least about 40000 $kg/m^2.hr$ in said first upright conduit whereby said gas rising in said first upright conduit contacts said liquid falling in said first upright conduit in countercurrent flow relationship in a contacting region between the locations at which said gas and said liquid are fed into said first upright conduit so that a part of said gas is drawn into a part of said liquid and flows downwardly from said contacting region and the remainder of said gas and the remainder of said liquid flow upwardly from said contacting region;

flowing said part of said gas and said part of said liquid downwardly through said first upright conduit and discharging same into a bath of said treating liquid below the upper surface of said bath wherein said bath is contained in a closed tank whereby said part of said gas rises above said bath;

feeding said remainder of the gas and said remainder of the liquid in concurrent flow relationship upwardly through said first upright conduit, thence through a reversely curved flow path and thence downwardly through a second upright conduit;

discharging said remainder of said liquid from the lower end of said second upright conduit into said bath and discharging said remainder of said gas separately from said remainder of said liquid.

4,192,834

CARBURETOR

Kenneth A. Berkbigler, Fenton, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,324
Int. Cl.[2] F02M *7/22*
U.S. Cl. 261—52 **8 Claims**

1. A carburetor for an internal combustion engine comprising;

a carburetor body in which an induction passage is formed for air to be drawn into said engine;

a throttle valve positioned in said induction passage and mounted on a rotatable shaft for movement between a

closed and an open position to control the quantity of air drawn into said engine;

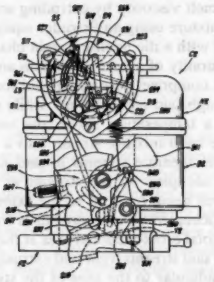
a throttle lever secured to said throttle valve shaft for rotation therewith;

a staging valve positioned in said induction passage and mounted on a rotatable shaft for movement between a closed and an open position, said staging valve being substantially closed during cranking of the engine whereby a suitable rich air-fuel mixture is supplied to the engine to start it;

means for moving said staging valve to a first open position when said engine starts and toward its fully open position as said engine warms up;

means including a lever secured to said staging valve shaft and rotatable therewith for limiting the opening movement of said staging valve to a second open position which is intermediate its first open position and its fully open position, the limiting of said staging valve to this second and less than fully open position limiting the usable air capacity of said carburetor; and

staging means for increasing the usable air capacity of said carburetor, said staging means being responsive to the movement of said throttle valve past a predetermined open position for enabling said staging valve to move freely between its second open position and a more fully open position solely in response to the demand for air by said engine, the more fully open position to which said



staging valve is moved being determined by the position past the predetermined open position to which said throttle valve is moved, said staging valve being freely movable to its fully open position when said throttle valve is fully opened, the movement of said staging valve to its fully open position increasing the usable air capacity of said carburetor to its maximum capacity and said staging means comprising a staging lever rotatable about a pivot and having a slot therein and a link connecting the first said lever with said staging lever, one end of said link being received in said slot and movable therein, said end of said link being at one end of said slot when said staging valve is substantially closed and traveling along the length of said slot as said staging valve is moved to its first open position and then toward its fully open position, and the movement of said staging valve being arrested when said one end of said link reaches the other end of said slot, the open position attained by said staging valve when its movement is arrested being said second open position thereof, and said staging means further comprising a staging link connecting said throttle lever and said staging lever, rotation of said throttle lever as said throttle valve opens producing rotation of said staging lever about its pivot and movement of said slot therein relative to said one end of the first said link whereby said staging valve is freely movable between its second open position and its fully open position in response to the demand for air by said engine.

4,192,835

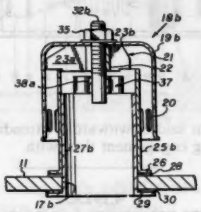
TRIPLE SEAL BUBBLE CAP ASSEMBLY WITH KIDNEY SHAPED INNER TUBULAR SLEEVE FOR A GAS AND LIQUID CONTACT APPARATUS

John R. Powers, Port Arthur, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 712,452, Aug. 6, 1976, abandoned, and a continuation-in-part of Ser. No. 845,200, Oct. 25, 1977, Pat. No. 4,146,950. This application Jan. 23, 1978, Ser. No. 871,315

Int. Cl.[2] B01D *3/20*

U.S. Cl. 261—114 A **9 Claims**



9. A bubble cap assembly comprising,

(a) a tubular sleeve with a tubular riser therearound supporting a bubble cap, said inner tubular sleeve having two opposite sides of the upper portion thereof cut inwardly a distance to include 120° of the circumference of each of said two opposite sides,

(b) said two cup portions of said inner tubular sleeve being bent kidney shaped forming two side portions of substantial length axially of an upright hold-down stud therein and contiguous with said upright hold-down stud supported therein, and

(c) said two kidney bent shaped side portions of substantial length being rigidly secured to said upright hold-down stud along the length thereof for providing a bubble cap assembly of reduced number of pieces requiring a reduced number of fabrication steps for lowering fabrication costs of the complete bubble cap assembly.

4,192,836

RESPIRATORY GAS HUMIDIFIER

Wolfgang Bartscher, Langen; Jürgen Sachtler, and Roland Schultner, both of Lübeck, all of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 951,037

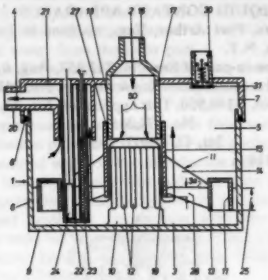
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747488

Int. Cl.[2] B01F *3/04;* **A61M** *15/00*

U.S. Cl. 261—142 **7 Claims**

1. A respiratory gas humidifier, comprising, a closed water reservoir having a water level therein, a predetermined level which may vary during operation, means for heating the water to a predetermined temperature, an outlet for the respiratory air extending out of the reservoir above the level of the liquid and inlet conduit means extending into the reservoir and including a float floating on the water having a sleeve portion defining a conduit within the sleeve portion for the flow of the respiratory air which is maintained by the float at a constant depth below the level of the liquid and opens into the liquid at the depth below the liquid level, whereby, the respiratory air which is delivered through said inlet conduit means exits into the water for upward bubbling therethrough at a constant bubbling height through the water, said float including an annular float portion surrounding said sleeve, said inlet conduit

means including a tubular conduit portion extending downwardly into the reservoir from the top thereof, said sleeve



being guided on said downwardly extending portion in substantially sealing engagement therewith.

4,192,837

CASELESS PROPELLANT CHARGE

Heinz Gawlick, Furth; Günter Marondel, Erlangen-Bruck, and Werner Siegelin, Nuremberg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1974, Ser. No. 457,609

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1973, 2316548

Int. Cl.[2] G21C *21/00*

U.S. Cl. 264—3 E **7 Claims**

1. A process for the manufacture of caseless propellant charges containing a priming material, which comprises impregnating a preselected outer portion of a prefabricated charge formed into a shaped body with a solution of priming material in a solvent, and thereafter, vaporizing the solvent from said propellant charge to provide said priming material as a primer charge within said propellant charge.

4,192,838

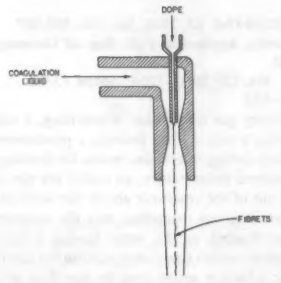
PROCESS FOR PRODUCING FILTER MATERIAL

Charles H. Keith, Charlotte, and Richard O. Tucker, Locust, both of N.C., assignors to Celanese Corporation, Charlotte, N.C.

Division of Ser. No. 730,039, Oct. 6, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,236

Int. Cl.[2] B29C *6/00*; B22D *23/08*

U.S. Cl. 264—10 **4 Claims**



1. A process for the production of an opaque, voidy, fibrillar structure which comprises the steps of preparing a dope formulation containing a cellulose ester dissolved in a solvent which consists essentially of non-solvent liquid which is miscible with the solvent for said cellulose ester and a co-miscible organic solvent for said cellulose ester; passing the cellulose ester dope through a capillary needle situated in or above the throat of a venturi through which a coagulation liquid is passed, at a velocity sufficient to attenuate the extrudate issuing from said capillary needle, said coagulation liquid being a non-solvent for said cellulose ester, whereby a precipitate is obtained in the form of a cellulose ester fibret.

4,192,839

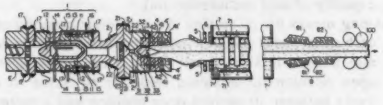
PROCESS FOR PRODUCING EXPANDED ARTICLE OF THERMOPLASTIC RESIN

Motoshige Hayashi, and Toshiro Kobayashi, both of Nara, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 3, 1978, Ser. No. 866,225

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—45.5 **8 Claims**



1. A process for producing an expanded article of a crystalline thermoplastic resin having a sensitively temperature-dependent melt viscosity by extruding and expanding a foamable resin mixture using an extruder equipped, on the forward end thereof with a die having a resin channel therein a nozzle having a plurality of apertures therein and a frame for expansion, which comprises conveying said foamable resin mixture stream through said resin channel while maintaining the resin mixture at a temperature above the melting point thereof, dividing the resin mixture stream into a plurality of substantially parallel separate streams in said nozzle, the cross-sectional area occupied by the streams at the entrance of the extrusion area being reduced to the extent that the cross-sectional area occupied by said streams is from about 5 to about 30% of the total cross-sectional area at the exit of the extrusion area, exiting said streams from said extrusion zone in a common plane perpendicular to the axes of the streams directly into a confined zone defined by said frame and maintained at a temperature at least about 30° C. lower than the temperature of the resin streams prior to the exiting, thereby forming a plurality of soft expanded resin strands corresponding in number to the number of strands, bringing the strands into surface contact with each other to fuse and bond them together to form a bonded expanded resin mass while simultaneously removing gases generated in the course of extrusion and expansion, passing the bonded mass into an unconfined zone to permit the mass to further expand while still in a softened condition, passing the further expanded mass into a confined receiving zone defined by a tapered receiving frame and of a smaller cross-sectional area than the further expanded mass, and cooling the mass to form an expanded article.

4,192,840

METHOD FOR PRODUCING A CAPACITOR DIELECTRIC WITH INNER BLOCKING LAYERS

Helmut Schmelz, Prien, and Werner Schwaen, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 815,579, Jul. 14, 1977, Pat. No. 4,131,903. This application May 23, 1978, Ser. No. 908,665

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634896

Int. Cl.[2] C04B *19/04*; G04B *33/32*

U.S. Cl. 264—61 **9 Claims**

1. A method for producing a capacitor dielectric with inner blocking layers formed of polycrystalline ceramic bodies made

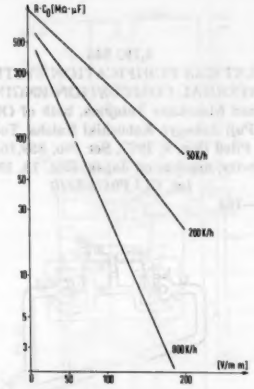
of a material with a perovskite structure on the basis of barium titanate and containing at least two different doping substances, one of the substances causing n-type conduction inside crystallites of the crystalline bodies and the other causing p-type conduction in a titanate intermediate phase disposed between grains of the crystallites, comprising the steps of:

(a) mixing starting components needed to make the bodies;

(b) grinding the components and reacting said components to produce a solid reaction product at 950° C. to 1100° C.;

(c) again grinding down the reaction product to a powder of desired particle size;

(d) forming the bodies from the powder and an inorganic binder by pressing and then subjecting the bodies to sintering in a sintering oven at 1250° to 1450° C.;



(e) promoting the influence of p-type doping substances by separting the p-type doping substances in the intermediate phase in the vicinity of the surfaces of the crystallite grains and at least partially recrystallizing by conducting said sintering of step (d) such that the bodies are first heated up to the sintering temperature at a heat-up rate of 200° K./h (°C./h) to 800° K./h at least in the temperature range from 1000° C. to the sintering temperature, maintaining the bodies at the sintering temperature for one to four hours, then slowly cooling the bodies down from the sintering temperature to at least 100° K. and some 350° K. below the sintering temperature at a rate of between 10° K./h and 100° K./h, after which remaining cooling to normal temperature is effected related to actual cooling conditions peculiar to the sintering oven being employed.

4,192,841

PROCESS FOR MAKING DUSTLESS, READILY-DISPENSIBLE PIGMENT GRANULES

George H. Robertson, Cincinnati, Ohio; Robert L. Rooney, Beith, and Robert B. Todd, Paisley, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,680

Claims priority, application United Kingdom, Nov. 18, 1977, 48062/77

Int. Cl.[2] C09B *67/00*; C09C *1/58*

U.S. Cl. 264—117 **10 Claims**

1. A process for producing an organic pigment or dyestuff composition in the form of dustless readily-dispersible granules which consists of contacting with agitation, an aqueous dispersion of a pigment and an aniline or a mono- or di-alkylaniline in which each alkyl group has 1 to 8 carbon atoms which is liquid at temperatures below 100° C., insoluble in water at pH values above 7, and soluble in water at pH values below 7, the pH being first above 7, maintaining the temperature above the melting point of the aniline, stirring at least until the pigment has migrated from the aqueous phase to the organic phase consisting of the aniline, and then reducing the pH to below 7 to render the aniline soluble in water, and recovering the resulting granules in a solvent-free condition.

4,192,842

METHOD FOR CASTING ULTRATHIN METHYLPENTENE POLYMER MEMBRANES

Shiro G. Kimura, Schenectady; Raymond G. Lavigne, Waterford, and Warella R. Browall, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 817,828, Jul. 21, 1977, Pat. No. 4,132,824.

This application Oct. 10, 1978, Ser. No. 949,641

Int. Cl.[2] B29C *5/00*; B29D *7/02*

U.S. Cl. 264—298 **21 Claims**

1. A process of casting a thin solid film of a methylpentene polymeric composition which comprises:

(a) depositing onto the surface of a liquid casting substrate a quantity of a casting solution comprising a solvent system and dissolved therein a methylpentene polymer and from zero to about 100 parts by weight of an organopolysiloxane-polycarbonate copolymer per 100 parts by weight of said methylpentene polymer, said casting solution being able to spontaneously spread over said substrate, and

(b) allowing the deposited solution to both spontaneously spread over said substrate and desolvate to effect formation of a thin solid film comprising methylpentene polymeric composition.

4,192,843

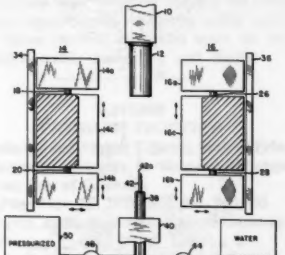
METHOD FOR BLOW MOLDING OF THERMOPLASTIC ARTICLES

George E. Trieschock, Plainfield, and George H. Dunbeker, Hightstown, both of N.J., assignors to Rheem Manufacturing Company, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,854

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—528 **2 Claims**



1. In a method comprising the step of introducing pressurized air interiorly of a parison of thermoplastic material at a sufficient pressure to transform the parison into a hollow article, the improvement comprising the steps of:

(a) providing a mixture of water and surface active matter, said mixture including said surface active matter in percentage of from **0.023** percent to **0.36** percent of the liquid volume of said mixture; and

(b) introducing said mixture into the interior surface of said parison in the course of air pressurization of said parison.

4,192,844

METHOXYPROPYLAMINE AND HYDRAZINE STEAM CONDENSATE CORROSION INHIBITOR COMPOSITIONS AND METHODS

William L. Trace, Pittsburgh, and Jerry L. Walker, Coraopolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 908,334, May 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 859,342, Dec. 12, 1977, abandoned. This application Aug. 23, 1978, Ser. No. 936,294

Int. Cl.[2] C23F *11/02, 11/04, 11/14*

U.S. Cl. 422—11 **4 Claims**

1. A steam condensate corrosion inhibiting composition consisting essentially of methoxypropylamine and from 1 to 15% by weight hydrazine.

3. A method of inhibiting corrosion in steam condensate systems which comprises maintaining in said systems an effective amount of a composition consisting essentially of methoxypropylamine and from 1 to 15% by weight hydrazine.

4,192,845

STERILIZATION PROCESS AND APPARATUS FOR INFUSION SOLUTIONS AND THE LIKE FILLED IN CONTAINERS

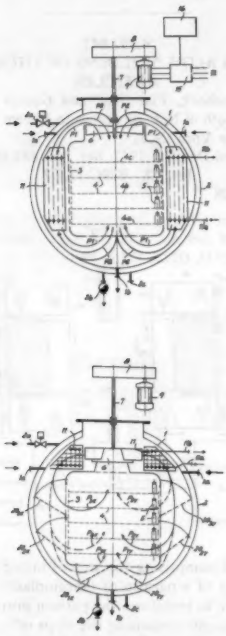
Karl Kalasek, Vienna, Austria, assignor to Firma Vereinigte Edelstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Mar. 27, 1978, Ser. No. 890,202

Claims priority, application Austria, Apr. 1, 1977, 2301/77

Int. Cl.[2] A61L *1/00, 3/00*

U.S. Cl. 422—25 **11 Claims**



1. In a process of sterilizing articles stacked on different levels in a closed chamber for a sterilization cycle, said sterilization cycle including heating-up and cooling-down periods, wherein the improvement comprises the steps of:

introducing a stream of a heated sterilization fluid into said chamber;

moving said fluid around said articles; and

periodically changing the direction of said stream for time periods that are short relative to the heating-up and cooling-down periods of the sterilization cycle.

4,192,846

EXHAUST GAS PURIFICATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

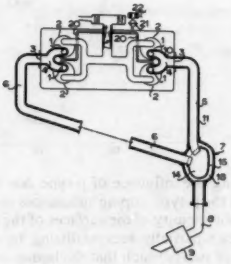
Hiroo Ōya, and Masakazu Tatejima, both of Ohta, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,165

Claims priority, application Japan, Dec. 13, 1976, 51-149622

Int. Cl.[2] F01N *3/10*

U.S. Cl. 422—168 **8 Claims**



1. Exhaust gas purification system for an internal combustion engine having at least two cylinders with corresponding ports and exhaust valves, comprising

a pair of first exhaust pipes, each of said exhaust pipes communicating with a port passage from the exhaust valve of the engine,

a thermal reactor communicating with said first exhaust pipes,

a second exhaust pipe communicating said thermal reactor to atmosphere,

insulation means for maintaining the exhaust gases at a high temperature, and

means for introducing secondary air into said first exhaust pipes,

said thermal reactor comprising an inner shell for defining a reaction chamber therein, an outer shell provided for covering said insulation means, a core shell supported in said inner shell spaced therefrom, and a space being provided between said inner shell and said core shell communicating with said second exhaust pipe,

said core shell having an egg-shaped body portion, a spherical back side and one opening at a front end of said body portion opposite the back side,

said opening being narrowed to prevent a high temperature zone of gases from moving out of said core shell,

said first exhaust pipes having end portions being inserted into said core shell through said opening such that exhaust gases discharging from both said first exhaust pipes flow together to said back side with swirling and are turned over on said back side.

4,192,847

THERMAL CONTROL IN DUAL TEMPERATURE SYSTEMS

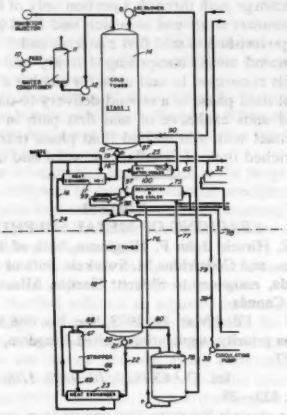
Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, New Rochelle, N.Y.

Continuation of Ser. No. 201,238, Nov. 22, 1971, abandoned, which is a division of Ser. No. 587,365, Sep. 26, 1966, which is a continuation of Ser. No. 822,973, Jun. 25, 1959, abandoned, which is a division of Ser. No. 188,925, Sep. 29, 1950, Pat. No. 2,895,803. This application Apr. 12, 1976, Ser. No. 676,217

The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.[2] B01D *11/04;* **C01B** *5/02;* **B01D** *19/00;* **C01B** *4/00*

U.S. Cl. 422—198 **14 Claims**



1. Apparatus for the thermal processing at different temperatures of carried and carrier fluids comprising, in series connection,

(a) a first means (**78**) for heating a flow of carrier gas and vaporizing thereinto a liquid to form carried vapor therein, said first means comprising an inlet thereto and an outlet therefrom for said flow and liquid inlet means,

(b) a second means (**18, 68**) for treating the so heated flow and further heating the same and adding further vapor of said liquid thereto to be carried thereby, said second means having a gas inlet end with a gas inlet thereto and a gas outlet end with a gas outlet therefrom and having its gas inlet connected to the outlet from said first means to receive said flow therefrom,

(c) a third means (**75, 97**) for cooling the so further heated flow and condensing carried vapor of such liquid therefrom, said third means having an inlet thereto connected to the gas outlet from said second means for receiving said flow therefrom, and having gas and liquid outlet means for discharging flows of the cooled gas and liquid condensate therefrom,

(d) fourth (**79**) and fifth (**100, 87**) means connected respectively to the gas inlet to said first means and to the gas outlet of said third means for delivering to said first means and from said third means said flow of carrier gas, and

(e) a sixth means (**98**) connected to the liquid outlet means of said third means for delivering therefrom, separate from said gas flow, liquid condensed from the carried vapor therein,

and further comprising

(f) seventh means (from **21** to **78**) connected to the liquid inlet means of said first means for delivering into direct contact with the flow of gas therein liquid to be vaporized therein, and

(g) said first and third means (**78** and **75**) having heat transfer means (**76, 75, 77**) interconnecting the same for extracting heat from said further heated flow in the third means to effect the cooling and condensing referred to in clause (c) and for transferring the so extracted heat to said first means to effect the heating and vaporizing referred to in clause (a),

(h) said heat transfer means comprising an indirect contact heat exchanger (**75**) for maintaining the gas and condensate in said third means out of contact with the gas and liquid in said first means.

4,192,848

DEVICE FOR PREPARATION AND HYGIENIZATION OF REFUSE OR REFUSE-CLARIFIED SLUDGE MIXTURES BY MEANS OF COMPOSTING

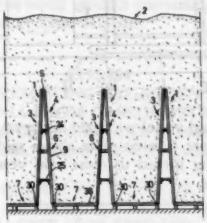
Hannes Willisch, Scheurenhof, 5025 Stommeln bei Koln, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,836

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711863; Mar. 18, 1977, 2711907

Int. Cl.[2] C05F *3/06, 9/02*

U.S. Cl. 422—239 **20 Claims**



1. A device for forming a clamp of refuse or refuse-clarified sludge mixtures in reduced and prepared form for composting by thermal rotting comprising a pair of movable transversely spaced upstanding wall means defining a space therebetween for receiving refuse, at least one of said pair of upstanding wall means being defined by a pair of upstanding elongated at least partially transversely spaced members having upper and lower end portions, support means disposed between said pair of movable upstanding wall means for receiving thereupon and supporting the received refuse, said support means including means for passing air therethrough whereby the refuse can be aerated thereby, and means for facilitating the removal of said movable upstanding wall means by moving the same sidewise away from said support means whereby refuse received upon said support means remains supported upon the latter in the absence of said movable upstanding wall means.

4,192,849

PRESSURE DIGESTER

Egmont Scheubeck, and Johann Gehring, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 960,790

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1977, 2753019

Int. Cl.[2] B01J *3/04;* **B65D** *41/04, 45/02*

U.S. Cl. 422—242 **11 Claims**

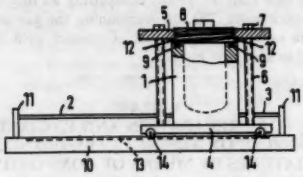
1. A pressure digester with a fast action closure for digesting biomaterials, comprising:

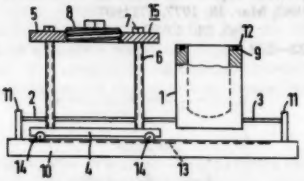
(a) a base;

(b) a pressure digesting vessel firmly mounted to said base; and

(c) a cover carriage movable on said base between a position wherein it is in alignment with said vessel and a position where it is laterally spaced from said vessel and comprising a lower pressure take up plate, an upper pressure take up plate, necked-down bolts and spacer sleeves connect-

ing said take up plates, and a closure in the form of a threaded plug disposed in one of said cover plates, whereby said cover carriage may be moved into alignment with said vessel with said lower take up plate below and said upper take up plate above said vessel and said threaded plug turned to close said vessel in a pressure tight manner.





4,192,850

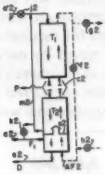
DUAL TEMPERATURE EXCHANGE SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, New Rochelle, N.Y.

Division of Ser. No. 492,186, Jul. 26, 1974, which is a division of Ser. No. 126,692, Mar. 22, 1971, Pat. No. 3,860,698. This application Jun. 28, 1976, Ser. No. 700,296

Int. Cl.[2] B01D *11/04, 19/00;* **C01B** *4/00, 5/04*

U.S. Cl. 422—255 **17 Claims**



1. Improved apparatus for producing a fluid containing a first material concentrated therein, by exchanging at two different temperatures said first material with a second material between chemically different first and second fluid phases which are physically separable from each other and which are each capable of containing each of said materials, said apparatus being of the type which comprises

(a) a pair of exchange units and means connected thereto for passing said second fluid phase through each of the second and first units of said pair in that order, and for also passing flows of said first fluid phase in countercurrent contact with said second fluid phase in said first and second units of said pair,

(b) means for maintaining said first and second units at different temperatures to cause said second fluid phase to become enriched in said first material in passing through said second unit, and to become impoverished in said first material in passing through said first unit, of said pair, and to cause the first fluid phase to become enriched in said first material in passing through said first unit and to become impoverished in said first material in passing through said second unit of said pair of units, and

(c) means connected to said units for passing enriched first fluid and second fluid between said units and for withdrawing a part of at least one of said enriched fluids;

and the improvement comprising, in combination with the foregoing:

(d) first means, including conduits, connected to said second unit for delivering thereto a first flow of said first fluid phase containing said materials from a source external to said pair of units, for discharging said first flow therefrom, and for passing said first flow in countercurrent contact with said impoverished second fluid in a first delivery-to-discharge path through a portion only of said second unit proximate to its end at which said fluid phases are most impoverished in said first material, and

(e) second means comprising delivery and discharge conduits connected to said units for passing a second flow of first fluid phase in a second delivery-to-discharge path in said units exclusive of said first path in countercurrent contact with said second fluid phase therein and as said enriched flow of first fluid between said units.

4,192,851

LEACHING OF METAL SULPHIDES

Horst E. Hirsch; John F. Higginson, both of Trail; Ernest G. Parker, and Godefridus M. Swinkels, both of Rossland, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Mar. 14, 1978, Ser. No. 886,368

Claims priority, application United Kingdom, Mar. 15, 1977, 10800/77

Int. Cl.[2] C01G *3/10, 9/06, 1/00*

U.S. Cl. 423—28 **4 Claims**

1. In a process for extracting metals from ores and concentrates containing metal sulfides and for separate recovery of elemental sulfur which comprises leaching said ores and concentrates with lixiviant capable of dissolving metals with concurrent oxidation of sulfide sulfur to elemental sulfur at a temperature in the range of from ambient to 175° C., said leaching resulting in the formation of a reaction slurry comprising dissolved metals, elemental sulfur and unreacted sulfides and at least one material chosen from the group consisting of gangue materials and precipitated compounds, and separating molten sulfur and unreacted sulfides from dissolved metals and said at least one material chosen from gangue materials and precipitated compounds, the improvement which comprises continuously directing a flow of said reaction slurry containing solids of which at least 80% has particle sizes smaller than 74μ at a temperature at which sulfur is present in the liquid state in the range of about 110° to 160° C. and at a pressure in the range of from the vapour pressure of the reaction mixture at the temperature at which S is present in the liquid state to 3000 kPa such that flashing of vapour is avoided into a separating step comprising a relatively quiescent zone free of turbulence; coalescing said elemental sulfur in the relatively quiescent zone; settling coalesced sulfur together with unreacted sulfides from said quiescent zone; maintaining a velocity in said flow in said relatively quiescent zone to cause separation of said slurry into a first and a second fraction, said velocity having an upward velocity component in the range of 1 to 100 cm/min., said first fraction containing dissolved metals and at least one material chosen from gangue materials and precipitated compounds, said at least one material having a terminal settling velocity less than said upward velocity component, and said second fraction containing coalesced liquid elemental sulfur and unreacted sulfides; stirring said coalescing elemental sulfur, settled coalesced sulfur and unreacted sulfides at a rotational speed in the range of 1 to 150 rpm and at a peripheral velocity in the range of 5 to 150 cm/sec.; separately discharging said first and second fractions from said separating step;

flashing the discharged first fraction in one or more stages; recovering solution containing dissolved metal; and subjecting the discharged second fraction to hot filtration to yield a filter-cake of unreacted sulfides and a filtrate of liquid sulfur.

4,192,852

PROCESS FOR PRECIPITATING IRON AS JAROSITE WITH A LOW NON-FERROUS METAL CONTENT

Robert V. Pammenter, and Curzon J. Haigh, both of Lindisfarne, Australia, assignors to Electrolytic Zinc Co. of Australasia Limited, Melbourne, Australia

Filed May 8, 1978, Ser. No. 903,524

Claims priority, application Australia, May 9, 1977, PD0030

Int. Cl.[2] C01G *3/00, 49/14*

U.S. Cl. 423—42 **15 Claims**

1. A process for precipitating iron as a jarosite from a sulphate solution containing ferric iron, free acid, and valuable non ferrous metals, characterised by treating the said solution in a stepwise process comprising:

(1) adjusting the composition of the solution so that the concentration of sulphuric acid lies in the range 0.1 to 40 grams per liter, and the ferric iron concentration lies in the range 5 to 35 grams per liter by

(a) cooling the solution to a temperature in the range 30° to 80° C. and sufficient to avoid substantial precipitation of dissolved ferric iron as a jarosite due to premature hydrolysis, partially neutralizing the free acid and then clarifying the solution, or by (a) and

(b) diluting the solution with an aqueous diluent containing 0 to 30 grams of sulphuric acid per liter

(2) heating the clarified solution so adjusted in one or more stages to a temperature in the range 80° C. to the boiling point of the solution at atmospheric pressure, in the presence of at least one ion chosen from the group consisting of sodium, potassium and ammonium ions, the mole ratio of the said ions to dissolved ferric iron lying in the range 0.1 to 10, and in the presence of recycled jarosite, and without addition of any further neutralizing agent other than any which may be added as a source of the aforesaid ions, so that substantially all of the ferric iron is precipitated as a jarosite. and

(3) separating the jarosite precipitated in step (2) from the solution by thickening, filtration and washing;

thereby producing a jarosite contaminated with only minor amounts of non-ferrous metals, and a solution containing dissolved valuable non-ferrous metals.

4,192,853

METHOD FOR PROCESSING WASTES RESULTING FROM PRODUCTION OF PHOSPHORUS

Vasily B. Chernogorenko, ulitsa Ezhena Potie, 11, kv. 86, Kiev; Tleubai M. Alzhanov, ulitsa Poltoratskaya, 18a, kv. 4, Chimkent; Kima A. Lynchak, ulitsa Kaunasskaya, 4, kv. 55; Simon V. Muchnik, Yaroslavov val, 17, kv. 12, both of Kiev; Evgeny S. Ishkhanov, ulitsa Dzhangildina, 8, kv. 22; Vladimir Y. Sergienko, ulitsa Gagarina, 84, kv. 5, both of Chimkent; Vladimir G. Sapian, ulitsa Dekabristov, 37, kv. 30, Vasilkov Kievskoi oblasti; Vladimir M. Koverya, ulitsa Bocharova, 8b, kv. 114, Zaporozhie; Mendel E. Pobortsev, ulitsa Vodopyanova, 7, kv. 1, Chimkent; Evgeny A. Markovsky, ulitsa Semashko, 21, kv. 58, Kiev; Valentina V. Dmitrenko, ulitsa 40 let Sovetskoi Ukrainy, 2, kv. 186, Zaporozhie; Vladimir I. Bykov, ulitsa Zaitseva, 22, kv. 83, Leningrad; Alexandr D. Kipchakbaev, ulitsa Uritskogo, 186, kv. 33, and Alexandr N. Vopilov, ulitsa Uritskogo, 219, kv. 34, both of Chimkent, all of U.S.S.R.

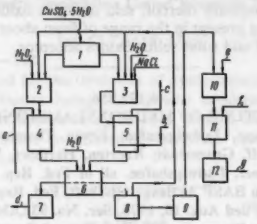
Filed Apr. 21, 1978, Ser. No. 898,973

Int. Cl.[2] C01D *3/02, 3/08;* **C01G** *3/00*

U.S. Cl. 423—122 **7 Claims**

1. Method of processing off-gases resulting from the production of phosphorus, which comprises treating said off-gases with an aqueous solution of copper sulphate of 15–20% by weight concentration and separating the resulting solid product containing mainly copper phosphide, chlorides and fluorides of alkali metals and silicon and silicates of calcium and aluminium, from the liquid product containing sulphuric acid, phosphoric acid and copper sulphate.

6. Method of processing slime wastes resulting from the production of phosphorus, which comprises treating said slime with an aqueous solution of copper sulphate of 30–50% by



weight concentration and separating the resulting solid product containing mainly copper phosphide, chlorides and fluorides of alkali metals and silicon and silicates of calcium and aluminium, from the liquid product containing sulphuric acid, phosphoric acid and copper sulphate.

4,192,854

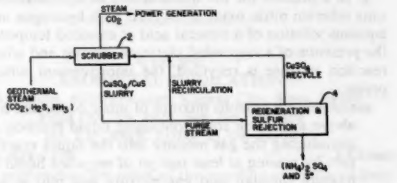
PROCESS FOR REMOVING HYDROGEN SULFIDE AND AMMONIA FROM GASEOUS STREAMS

Walter W. Harvey, Bedford, and Alkis C. Makrides, New Center, both of Mass., assignors to EIC Corporation, Newton, Mass.

Continuation-in-part of Ser. No. 720,345, Sep. 3, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 886,282

Int. Cl.[2] C01B *17/16;* **C01C** *3/00, 1/244*

U.S. Cl. 423—220 **11 Claims**



1. A process for removing hydrogen sulfide from a gas stream also containing ammonia, comprising

establishing a recirculating liquid stream comprising a liquid solution of a scrubbing agent consisting essentially of copper sulfate, said stream being buffered to an acidic pH with ammonium sulfate, said pH being sufficiently acidic to prevent the precipitation of copper as hydroxide or basic hydrated oxides at the operating conditions,

contacting said liquid stream with said gas stream to react said copper sulfate with said hydrogen sulfide to precipitate copper sulfide, and

removing copper sulfide precipitate from said recirculating liquid stream.

4,192,855

PROCESS FOR THE SIMULTANEOUS SEPARATION OF SULFUR AND NITROGEN OXIDES FROM A GASEOUS MIXTURE

Edward A. Ginger, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 10, 1978, Ser. No. 894,963

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 **7 Claims**

1. A process for the simultaneous separation of oxides of sulfur and nitrogen from a gaseous mixture containing said

oxides and oxygen which comprises contacting said mixture and ammonia with a solid sulfur oxides acceptor at a temperature of from about 150° to about 450° C., said solid acceptor comprising copper, copper oxide, or a mixture thereof dispersed on a carrier material in combination with a nitrogen oxides conversion catalyst consisting of cerium metal, cerium oxide, or a mixture thereof, said nitrogen oxides conversion catalyst being present in the range of from about 0.01 to about 2.0 wt. % of said solid sulfur oxides acceptor.

4,192,856

MANUFACTURE OF HYDROXYLAMMONIUM SALTS

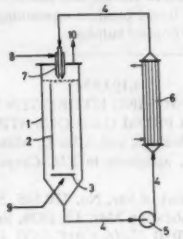
Günther Rapp, Ludwigshafen; Erwin Thomas, Freinsheim; Dieter Wolf, Gruenstadt; Kuerten, Heribert, Neustadt, and Peter Zehner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,636

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736872

Int. Cl.² C01B *21/14*

U.S. Cl. 423—387 **6 Claims**



1. In a process for the manufacture of hydroxylammonium salts wherein nitric oxide is reduced with hydrogen in a dilute aqueous solution of a mineral acid at elevated temperatures in the presence of a suspended platinum catalyst and wherein the reaction mixture is recycled, the improvement which comprises:

maintaining a gaseous mixture of nitric oxide and hydrogen above a reaction zone containing liquid reaction mixture; introducing the gas mixture into the liquid reaction mixture by passing at least one jet of recycled liquid reaction mixture through said gas mixture and into at least one circulation zone containing liquid reaction mixture whereby said gases are finely distributed in the reaction mixture; deflecting the jet of reaction mixture and unconverted gases upwardly in an annular zone surrounding the circulation zone; and recycling reaction mixture of low gas content to the circulation zone from a separation zone located under the reaction zone.

4,192,857

SULPHUR PRODUCTION

Jacques Tellier, Pau; André Philippe; Pierre Mathieu, both of Orthez, and Robert Voirin, Mourenx, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Continuation of Ser. No. 733,116, Oct. 18, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,509

Claims priority, application France, Oct. 17, 1975, 75 31769

Int. Cl.² C01B *17/04*

U.S. Cl. 423—576 **11 Claims**

1. A Claus process for the production of sulphur by the action of H_2S on SO_2 in the presence of an oxide catalyst which comprises contacting a gas containing H_2S and SO_2 and 50–5000 vpm O_2 in at least one catalytic reaction zone containing a deoxidation catalyst and a Claus oxide catalyst such that said gas encounters for 0.1–3 seconds NTP the deoxidation catalyst prior to encountering the Claus oxide catalyst, said deoxidation catalyst consisting of a supported metal compound of at least one metal selected from the group consisting of iron, nickel, cobalt, copper and zinc, the support having a surface area of at least 100 m^2/g and a porosity of at least 0.2 ml/g, said deoxidation catalyst containing about 0.5–10% by weight of metal relative to the Claus oxide catalyst, whereby the magnitude of said Claus catalyst activity degradation with time is retarded by use of said deoxidation catalyst.

4,192,858

PRODUCTION OF RADIOIODINATED T_3 AND T_4

Max G. Reese, Salt Lake City, and Richard H. Hales, West Jordan, both of Utah, assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Feb. 21, 1978, Ser. No. 879,800

Int. Cl.² A61K *43/00*; G21H *5/02*

U.S. Cl. 424—1 **8 Claims**

1. In a process for producing radioiodinated T_4 of high specific activity by radioiodination of T_3, the improvement comprising:

after a period of at least 10 days further purifying said radioiodinated T_4 to remove radioactive non-antigenic contamination and provide radioiodinated T_4 of high specific activity having long term stability.

4,192,859

CONTRAST MEDIA CONTAINING LIPOSOMES AS CARRIERS

George B. Mackaness, Princeton, and Joseph P. Hou, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 29, 1978, Ser. No. 946,976

Int. Cl.² A61K *29/02*

U.S. Cl. 424—5 **22 Claims**

1. An X-ray contrast medium comprising an X-ray contrast agent and a liposome as a carrier therefor, said liposome comprising a lecithin and a sterol, said X-ray contrast agent being present in an amount within the range of from about 20 to about 60% by weight of said contrast medium.

4,192,860

METHODS FOR TREATING DISEASE CONDITIONS

Alan J. Griffiths, Haveringham, England, assignor to Fisons Limited, London, England

Filed Apr. 27, 1978, Ser. No. 900,709

Claims priority, application United Kingdom, May 6, 1977, 18995/77; May 26, 1977, 22186/77

Int. Cl.² A61K *9/14, 9/00, 31/35*

U.S. Cl. 424—43 **12 Claims**

1. A method for curative treatment of a disease condition in cats, dogs horses or cattle as follows:

(a) in horses: broken wind, heaves, chronic pulmonary disease, laminitis or sweat itch;

(b) in cattle: fog fever, husk, acute bovine pulmonary emphysema, bovine farmer's lung and respiratory diseases due to Respiratory Syncytial Bovine Virus;

(c) in cats or dogs: allergic condition produced in response to allergens present in foods or food additives, in therapeutic agents, in parasitic fungi, produced by bacterial or fungal infection, or as a response to inhaled or contact antigens;

which method comprises administering an effective amount of an active ingredient having sodium cromoglycate like activity to cattle or to a horse, pig, cat or dog suffering from such a condition.

4,192,861

HYDROCARBON PROPELLED AEROSOL HAIR SPRAY COMPOSITIONS

Albert L. Micchelli, Middletown; Frank A. Nowak, Jr., Somerville, and Stuart H. Ganslaw, Morristown, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 5, 1978, Ser. No. 903,441
Int. Cl.[2] A61K 7/00, 9/00
U.S. Cl. 424—47 8 Claims

1. Aerosol hair spray compositions in aerosol containers, said compositions comprising 0.5 to 5% by weight of a resin consisting of a copolymer of at least one unsaturated monocarboxylic acid and at least one vinyl or vinylidene monomer, 5–60% hydrocarbon propellent, with solvent comprising the remainder of said composition (to 100%), wherein 7 to 100% of the available carboxyl groups of said resin are neutralized, depending on the type of resin employed, with at least 50% of the carboxyl groups which are to be neutralized being neutralized with a long chain primary, secondary or tertiary amine, wherein the longest chain of the amine contains 8 to 20 carbon atoms, the amount of neutralization being such that the solubility of the resin is substantially increased.

4,192,862

HAIRSPRAY CONTAINING A HAIRSPRAY RESIN AND A DRAG REDUCING AGENT

Roger W. Pengilly, Worcester Park, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,227
Claims priority, application United Kingdom, Jul. 28, 1977, 31780/77
Int. Cl.[2] A61K 7/11
U.S. Cl. 424—47 13 Claims

1. A hairspray product consisting of a hairspray composition within a container for spraying the composition onto the hair, wherein the hairspray composition consists essentially of

(A) about 0.4% to about 7.5% by weight of a hairspray resin;

(B) about 5% to about 99.5% by weight of a solvent for the hairspray resin;

(C) a drag reducing agent, dissolved in said solvent, in an amount effective to enhance the holding power of the hairspray composition, the weight ratio of the hairspray resin to the drag reducing agent being about 10,000:1 to about 2:1 and the amount of the drag reducing agent being less than about 0.3% by weight of the hairspray composition, said drag reducing agent being a polymer soluble in said solvent and of such a high molecular weight that it has a drag reduction efficiency of at least 2%; and

(D) 0% to about 90% by weight of a propellant.

4,192,863

COMPLETELY ONE-STEP PERMANENT WAVE SOLUTION AND A METHOD FOR USING THE SAME

Tokuzo Kondo, 92, Nishi-Koiso, Ohisomachi, Kanagawa Prefecture, Japan

Continuation-in-part of Ser. No. 363,735, May 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 735,203, Jun. 7, 1968, abandoned, which is a continuation-in-part of Ser. No. 459,879, May 28, 1965, abandoned, which is a continuation-in-part of Ser. No. 80,758, Jan. 5, 1961, abandoned. This application Jun. 17, 1975, Ser. No. 587,623
Claims priority, application Japan, Jun. 12, 1964, 39-33015
Int. Cl.[2] A61K 7/09
U.S. Cl. 424—72 6 Claims

1. A permanent wave solution which consists of in percent by weight; ammonium thioglycolate 2.0 to 5.0%; tartaric acid or citric acid 0.10 to 0.40%; ethyl alcohol 1.0 to 10.0%; caustic potash or caustic soda 0.02 to 0.10%; 28% ammonia water 1.0 to 2.4%; monoethanolamine, diethanolamine, triethanolamine or mixtures thereof 0.01 to 1.0%; and distilled water as the remainder, said solution being adjusted to a pH of 7.0 to 9.6.

4,192,864

METHOD FOR THE TREATMENT OF DYSLIPIDAEMIA AND ARTERIOSCLEROSIS

Tiberio Bruzzese, and Lorenzo Ferrari, both of Milan, Italy, assignors to Prospa N.V., Curacao, Netherlands Antilles

Filed May 30, 1978, Ser. No. 910,951
Claims priority, application United Kingdom, May 30, 1977, 22736/77
Int. Cl.[2] A61K 35/00
U.S. Cl. 424—122 2 Claims

1. A method for the treatment of dyslipidaemia and arteriosclerosis in human beings, comprising administering methyl partricin to a human being in need of said treatment in an amount sufficient to effectively alleviate dyslipidaemia or arteriosclerosis.

4,192,865

SEDATIVE PREPARATION FOR ANIMALS AND METHOD

Joachim Helbig, Tutzing, Fed. Rep. of Germany, assignor to Verlapharm von Ehrlich A.G., Emmenbrucke, Switzerland

Filed Apr. 27, 1978, Ser. No. 900,568
Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720288
Int. Cl.[2] A61K 33/14, 31/195
U.S. Cl. 424—153 9 Claims

1. A method of sedating a warm-blooded animal other than human, selected from the group consisting of horses, cattle, pigs, sheep and poultry, comprising the step of administering to such a warm-blooded animal which it is desired to sedate, a magnesium aminodicarboxylic acid chloride, or a magnesium salt of an aminodicarboxylic acid in combination with magnesium chloride, at a dosage sufficient to sedate said warm-blooded animal and said aminodicarboxylic acid in each instance being selected from the group consisting of glutamic acid and aspartic acid.

4,192,866

ANORECTAL MEDICATION

Ralph Anderson, 6218 Freeman, Kansas City, Kans. 66104

Filed Oct. 10, 1978, Ser. No. 949,819
Int. Cl.[2] A61K 33/06, 33/04, 35/78
U.S. Cl. 424—154 3 Claims

1. A preparation for relief of the swelling sympton of hemmorrhoids by topical application thereto, said preparation comprising:

(a) fragments of ripe berries of the plant *Solanum carolinense;* combined with

(b) an application medium comprising polyglycerides; said polyglycerides being compatible for use with human tissue;

(c) in the nature of about 250 milliliters of said polyglycerides being included in said preparation for each 26 to 30 grams of said berry fragments.

3. A method for treating hemorrhoid swelling in a human including the step of:

(a) applying a dosage in the nature of 5 grams of a preparation during about a 24 to 48 hour period for at least 3 consecutive such periods to the anorectal region wherein hemorrhoids are present; and wherein

(b) said preparation comprises the following composition proportions:

(1) from about 26 grams to about 30 grams of fragmatized ripe berries of the plant *Solanum carolinense;*

(2) about 250 milliliters of polyglycerides compatible for use with human tissue;

(3) about 5.3 grams of sulfur;

(4) about 4.4 grams of aluminum ammonium sulfate; and

(5) about 8 milliliters of turpentine.

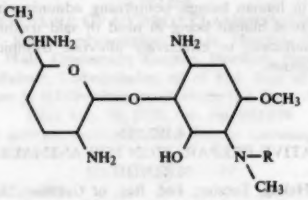
4,192,867

2-DEOXYFORTIMICIN A, 4-N-ALKYL AND 4-N-ACYL-2-DEOXYFORTIMICIN B DERIVATIVES

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,006
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 10 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of acyl, an amino acid residue, loweralkyl, aminoloweralkyl, N-monoloweralkylaminoloweralkyl, hydroxyloweralkyl, N,N-diloweralkylaminoloweralkyl, and hydroxy-substituted aminoloweralkyl, and the pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition comprising an anti-bacterially effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

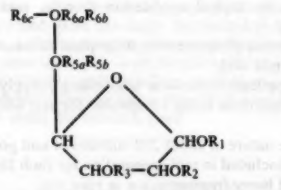
4,192,868

NOVEL ARYL-HEXAFURANOSIDES AND PROCESSES FOR THEIR PREPARATION

Jean M. J. Tronchet, Grilly, France; Bruno Baehler, Troinex, Switzerland; Alberto Rossi, Oberwil, Switzerland; Gerhard Baschang, Bettingen, Switzerland, and Alex Sele, Muttenz, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 22, 1978, Ser. No. 880,255
Claims priority, application Switzerland, Feb. 25, 1977, 2396/77
Int. Cl.[2] A61K *31/70*; C07H *15/00*
U.S. Cl. 424—180 42 Claims

1. A compound of the formula I



(I)

in which R_1 is lower alkyl or cycloalkyl having 5–8 carbon atoms and R_2 is hydrogen, lower alkyl or acyl, or R_1 and R_2 together are lower alkylidene or cycloalkylidene having 4 to 7 carbon atoms, R_3 is hydrogen, lower alkyl, lower alkenyl or aryl lower alkyl, R_{5a} and R_{6a} independently of one another are hydrogen or lower alkyl, R_{5b} and R_{6b} independently of one another are hydrogen, hydroxy, lower alkoxy, amino, lower alkylamino or diloweralkylamino or R_{5b} and R_{6b} together are a C-C bond, epoxy, lower alkylidene, or mono- or dihalogen-lower alkylidene and R_{6c} is 1- or 2-naphthyl, diphenyl, phenyl, halogenophenyl trifluoromethyl-phenyl, lower alkyl-phenyl, lower alkoxy-phenyl, cyano-phenyl, nitro-phenyl, amino-phenyl, lower alkylamino-phenyl or dilower alkylamino-phenyl.

41. An anti-inflammatory or an analgesic pharmaceutical composition which comprises a therapeutically effective amount of a compound of claim 1 together with a pharmaceutically acceptable carrier.

42. A method for the treatment of inflammation which comprises administeration of a therapeutical effective amount of a compound of claim 1.

4,192,869

CONTROLLED IMPROVEMENT OF THE O_2RELEASE BY INTACT ERYTHROCYTES WITH LIPID VESICLES

Yves-Claude Nicolau, Mulheim-Ruhr, and Klaus Gersonde, Aachen, both of Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH., Mulheim-Ruhr, Fed. Rep. of Germany

Division of Ser. No. 909,081, May 24, 1978, which is a continuation-in-part of Ser. No. 832,867, Sep. 13, 1977, abandoned. This application Oct. 17, 1978, Ser. No. 952,224
Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2740053
Int. Cl.[2] A61K *31/685, 31/045*
U.S. Cl. 424—199 4 Claims

1. Lipid vesicles containing inositol hexaphosphate in which the lipid consists essentially of phosphatidylcholine:phosphatidylserine:cholesterol in the mole ratio 10 to 5:4 to 1:10 to 3.

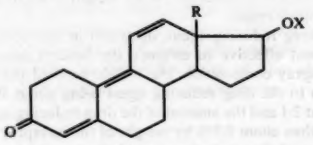
4,192,870

NOVEL ZOOTECHNICAL COMPOSITIONS

Jean A. Grandadam, Saint-Maur des Fosses; Alain Jobard, Le Blanc-Mesnil, and Jean-Pierre Scheid, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 21, 1978, Ser. No. 898,872
Claims priority, application France, Apr. 27, 1977, 77 12731
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—240 18 Claims

1. Novel zootechnical composition for increasing the weight of farm animals comprising a mixture of zeranol and an anabolisant steroid of the formula



wherein R is alkyl of 1 to 3 carbon atoms and X is selected from the group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms, lower alkenyl and lower alkynyl of 2 to 6 carbon atoms in which one of the carbon atoms may be replaced with an oxygen atom and acyl of an organic carboxylic acid of 1 to 18 carbon atoms.

10. A method of increasing the weight of farm animals comprising administering to farm animals an amount of a composition of claim 1 sufficient to increase the weight gain of the animals.

4,192,871

CHEMICAL COMPOUNDS

Gordon H. Phillipps, Wembley; Peter J. May, North Harrow, and Barry E. Ayres, Ickenham, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 752,513, Dec. 20, 1976, abandoned. This application May 22, 1978, Ser. No. 907,915
Claims priority, application United Kingdom, Jan. 6, 1976, 357/76
Int. Cl.[2] C07J *41/00*
U.S. Cl. 424—241 23 Claims

1. Steroids of the pregnane and androstane series and their 19-nor analogues having a 3α-hydroxy group; a 5α-hydrogen atom or a 4,5- or 5,6-double bond; a 17α-hydrogen atom; and at

the 11β-position a group of the formula R^1COO- where R^1 is a C_{1-6}alkyl group or a monocyclic aralkyl group having a C_{1-6}alkyl portion, the alkyl group or alkyl portion being substituted by an amino group of the formula $-NR^aR^b$, in which R^a and R^b, which may be the same or different, are hydrogen atoms, alkyl, alkenyl, cycloalkyl, cycloalkenyl or phenalkyl groups, provided that at least one of R^a and R^b is other than hydrogen and that R^a and R^b together contain up to 14 carbon atoms, or in which R^a and R^b, together with the nitrogen atom, represent a saturated or ethylenically unsaturated non-aromatic monocyclic heterocyclic group having 3–10 ring members or a saturated or unsaturated bicyclic heterocyclic group having up to 10 ring carbon atoms, the ring containing the nitrogen atom being non-aromatic and either saturated or ethylenically unsaturated, which heterocyclic groups may be unsubstituted or substituted by C_{1-4}alkyl; the 17aα-hydrogen D-homo analogues thereof; and the acid addition salts thereof.

16. Pharmaceutical compositions comprising a compound as claimed in claim **1**, together with a pharmaceutical carrier or excipient.

21. A compound as claimed in claim **1**, wherein said compound is 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one phosphate, 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate, 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one tricarballylate, 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one hydrochloride, 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one hemisulphate, 11β-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one tartrate, 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one lactate and 11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one glutarate, 11β-piperidinoacetoxy-3α-hydroxy-5α-pregnan-20-one, 11β-piperidinoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate, 11β-piperidinoacetoxy-3α-hydroxy-5α-pregnan-20-one hydrochloride, 11β-(3-methylpiperidinoacetoxy)-3α-hydroxy-5α-pregnan-20-one, 11β-(3-methylpiperidinoacetoxy)-3α-hydroxy-5α-pregnan-20-one citrate, 11β-(4-methylpiperidinoacetoxy)-3α-hydroxy-5α-pregnan-20-one, 11β-(4-methylpiperidinoacetoxy)-3α-hydroxy-5α-pregnan-20-one citrate, 11β-(2-methylpiperidinoacetoxy)-3α-hydroxy-5α-pregnan-20-one, 11β-(2-methylpiperidinoacetoxy)-3α-hydroxy-5α-pregnan-20-one citrate, 11β-hexamethyleniminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 11β-hexamethyleniminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate; 2β-ethoxy-11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 2β-ethoxy-11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate, 2β-ethoxy-11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one tricarballylate, 2β-methyl-11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 2β-methyl-11β-N,N-dipropylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate, 2β-ethoxy-11β-N-methyl-N-butylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 2β-ethoxy-11β-N-methyl-N-butylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate, 2β-propoxy-11β-N,N-diethylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 2β-propoxy-11β-N,N-diethylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate; 3α-hydroxy-3β-methyl-11β-piperidinoacetoxy-5α-pregnan-20-one, 3α-hydroxy-3β-methyl-11β-piperidinoacetoxy-5α-pregnan-20-one citrate; 17β-cyano-3α-hydroxy-11β-N,N-dipropylaminoacetoxy-5α-androstane, 17β-cyano-3α-hydroxy-11β-N,N-dipropylaminoacetoxy-5α-androstane citrate; 3α-hydroxy-11β-N-methyl-N-1',3'-dimethylbutylaminoacetoxy-5α-pregnan-20-one, 3α-hydroxy-11β-N-methyl-N-1',3'-dimethylbutylaminoacetoxy-5α-pregnan-20-one citrate; 11β-N,N-diethylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one, 11β-N,N-diethylaminoacetoxy-3α-hydroxy-5α-pregnan-20-one citrate; 2β-bromo-3α-hydroxy-11β-N-butyl-N-methylaminoacetoxy-5α-pregnan-20-one, 2β-bromo-3α-hydroxy-11β-N-butyl-N-methylaminoacetoxy-5α-pregnan-20-one citrate; 11β-N-butyl-N-methylaminoacetoxy-17β-cyano-3α-hydroxy-5α-androstane or 11β-N-butyl-N-methylaminoacetoxy-17β-cyano-3α-hydroxy-5α-androstane citrate.

4,192,872
6-HALO-3-LOWER ALKYL-7,8-DIHYDROXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

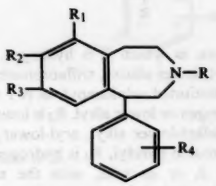
Continuation-in-part of Ser. No. 742,965, Nov. 17, 1976, Pat. No. 4,160,765. This application Mar. 31, 1978, Ser. No. 892,063

Claims priority, application South Africa, Oct. 4, 1977, 77/5910

Int. Cl.[2] **A61K** *31/55;* **C07D** *223/16*

U.S. Cl. 424—244 **14 Claims**

1. A chemical compound of the structural formula:



in which:

R is methyl, ethyl or allyl;

R_1 is halo or trifluoromethyl;

R_2 and R_3 are hydroxy or lower alkanoyloxy of 2–7 carbons; and

R_4 is hydrogen, methyl, halo, methoxy or trifluoromethyl; or a nontoxic, pharmaceutically acceptable salt thereof.

3. A compound of claim **1** in which R_4 is hydrogen and R_1 is chloro.

6. The compound of claim **1** being 6-chloro-3-methyl-7,8-dihydroxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine and its hydrohalide or methane sulfonate salt.

10. The method of producing central nervous system dopaminergic activity in a subject in need thereof comprising administering to said subject orally or by injection a nontoxic dopaminergic quantity of a compound of claims **1**, **3** or **6**.

4,192,873
ANTI-INFLAMMATORY 2-SULPHONYL- (OR -SULPHINYL)-2-AMINOACETOPHENONES

Pier G. Ferrini, Binningen; Richard Goschke; Alfred Sallmann, both of Bottmingen, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

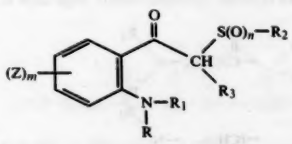
Filed Oct. 28, 1977, Ser. No. 846,305

Claims priority, application Switzerland, Nov. 25, 1976, 14845/76

Int. Cl.[2] **A61K** *31/135, 31/44;* **C07C** *87/50, 87/60*

U.S. Cl. 424—246 **13 Claims**

1. An ortho-aminoacetophenone of the formula I



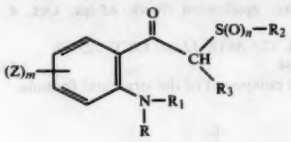
(I)

and its tautomers, in which Z is hydrogen, halogen, lower alkyl, cycloalkyl, lower alkoxy, trifluoromethyl, nitro or substituted or unsubstituted sulphamoyl, m is 1 or 2, R is aryl, R_1 is hydrogen or lower alkyl, R_2 is lower alkyl, cycloalkyl, aryl, cycloalkyl-lower alkyl, aryl-lower alkyl or substituted or un-

substituted pyridyl, R_3 is hydrogen or lower alkyl and n is 1 or 2, with the exception of 2'-[N-(p-methoxyphenyl)-amino]-2-(methyl-sulphinyl)-acetophenone, or its salts.

12. A fibrinolytic and antiinflammatory pharmaceutical formulation containing a correspondingly effective amount of an orthoaminoacetophenone as claimed in claim 1, together with a pharmaceutical, solid or liquid excipient.

13. A fibrinolythic and antiinflammatory pharmaceutical formulation containing a correspondingly effective amount of an ortho-aminoacetophenone of the formula I



(I)

and its tautomers, in which Z is hydrogen, halogen, lower alkyl, cycloalkyl, lower alkoxy, trifluoromethyl, nitro or substituted or unsubstituted sulphamoyl, m is 1 or 2, R is lower alkyl, R_1 is hydrogen or lower alkyl, R_2 is lower alkyl, cycloalkyl, aryl, cycloalkyl-lower alkyl, aryl-lower alkyl or substituted or unsubstituted pyridyl, R_3 is hydrogen or lower alkyl and n is 1 or 2, or its salts, with the exception of 2'-methylamino-2-(methylsulphinyl)-acetophenone, together with a pharmaceutical, solid or liquid excipient.

4,192,874

SUBSTITUTED 1,2,6,7-TETRAHYDROINDOLO[1,7-AB][1,5]BENZODIAZEPINES

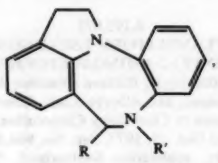
Edward J. Glamkowski, Warren, and James M. Fortunato, Somerville, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Nov. 2, 1978, Ser. No. 956,903

Int. Cl.[2] **A61K** *31/55;* **C07D** *487/04*

U.S. Cl. 424—248.54 **31 Claims**

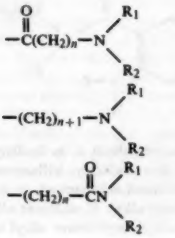
1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein

R is hydrogen, loweralkyl, or cycloalkyl;

R' is



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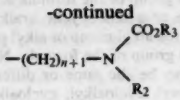


n is an integer from 1 to 3;

R_1 taken alone is hydrogen, loweralkyl or phenylloweralkyl;

R_2 taken alone is hydrogen or loweralkyl;

or R_1 and R_2, taken together with the nitrogen to which they are attached, are pyrrolidinyl, piperidino, morpholino or phenylpiperazinyl; and

R_3 is loweralkyl.

4,192,875

CYCLIC HEXAPEPTIDE

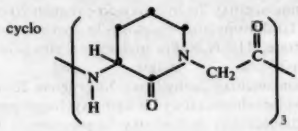
Daniel F. Veber, Ambler, and Roger M. Freidinger, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 2, 1979, Ser. No. 8,904

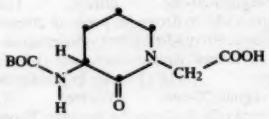
Int. Cl.[2] **A61K** *31/365, 41/435;* **C07D** *210/00*

U.S. Cl. 424—256 **7 Claims**

1. The cyclic hexapeptide having the structure:



and the dipeptide



4,192,876

4-HYDROXY-3-NITRO-QUINOLINE-2(1H)-ONES

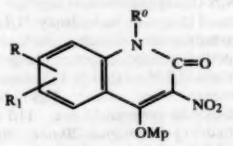
Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 707,266, Jul. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 598,539, Jul. 23, 1975, abandoned. This application Jun. 20, 1977, Ser. No. 808,345

Int. Cl.[2] **A61K** *31/47;* **C07D** *215/22, 491/04*

U.S. Cl. 424—258 **22 Claims**

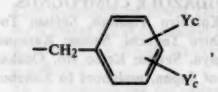
1. A compound of the formula



wherein

R^O is alkenyl of 3 to 6 carbon atoms,

or



R and R' are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro, or trifluoromethyl, or R and R' together form 6,7-methylenedioxy, with proviso that only one of R and R' can be from the group of nitro and trifluoromethyl,

Mp is hydrogen or a pharmaceutically acceptable cation,

Yc is hydrogen, fluoro or chloro, and

Y_c' is fluoro, chloro, bromo or trifluoromethyl, with the further proviso that the unsaturation in said alkenyl is on other than the alpha carbon atom.

2. A pharmaceutical composition comprising an inert pharmaceutically acceptable carrier and an allergy treating effective amount of a compound of claim 1.

4,192,877

NEUROMUSCULAR BLOCKING AGENTS

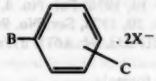
John J. Savarese, Boxford; Richard J. Kitz, Dover, both of Mass., and Sara Ginsburg, New York, N.Y., assignors to Massachusetts General Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 820,794, Aug. 1, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,713

Int. Cl.[2] **A61K** *31/47;* **C07D** *217/10, 217/20*

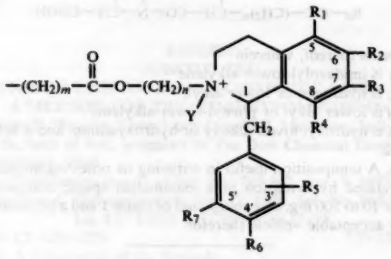
U.S. Cl. 424—258 **54 Claims**

1. A compound of the formula (I)



(I)

where B and C are each



where

m is, 2, 3 or 4,

C is para or meta to B,

n is 2, 3 or 4

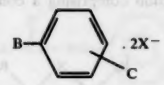
R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are the same or different and are each hydrogen or lower alkoxy of 1 to 4 carbon atoms,

Y is lower alkyl of 1 to 4 carbon atoms, and

X is a pharmaceutically acceptable anion, provided that at least one of R_1 and R_4 is lower alkoxy and at least one of R_5 and R_7 is lower alkoxy.

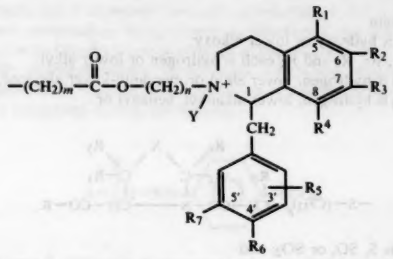
11. The compound of claim 7 in which X is mesylate, or chloride.

32. A pharmaceutical preparation for the parenteral administration comprising an effective neuromuscular blocking amount of the compound of the formula (I)



(I)

where B and C are each



where

m is, 2, 3 or 4,

C is para or meta to B,

n is 2, 3 or 4,

R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are the same or different and are each hydrogen or lower alkoxyl of 1 to 4 carbon atoms, Y is lower alkyl of 1 to 4 carbon atoms,

X is a pharmaceutically acceptable anion, provided that at least one or R_1 to R_4 is lower alkoxyl and at least one of R_5 to R_7 is lower alkoxyl, and a pharmaceutically acceptable liquid carrier therefore.

4,192,878

DERIVATIVES OF THIAZOLIDINECARBOXYLIC ACIDS AND RELATED ACIDS

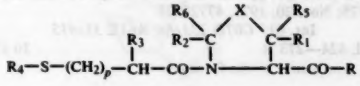
Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 836,107, Sep. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 747,281, Dec. 3, 1976, abandoned. This application May 22, 1978, Ser. No. 907,452

Int. Cl.[2] **A61K** *31/425, 31/54;* **C07D** *277/04, 277/06*

U.S. Cl. 424—270 **23 Claims**

1. A compound of the formula



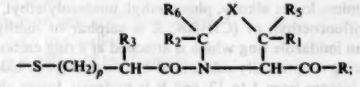
wherein

R is hydroxy or lower alkoxy;

R_1, R_2, R_5 and R_6 each is hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl or mercapto-lower alkylene;

R_4 is hydrogen, lower alkanoyl, benzoyl or

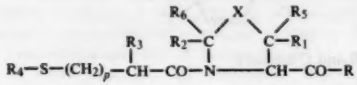


X is S, SO, or SO_2; and

p is 0 or 1;

and basic salts thereof; wherein the terms lower alkyl, lower alkoxy and lower alkylene refer to groups having 1 to 7 carbon atoms and the term lower alkanoyl refers to groups having up to 7 carbon atoms.

20. A method for reducing blood pressure which comprises administering a composition comprising a compound of the formula



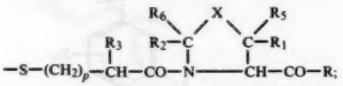
wherein

R is hydroxy or lower alkoxy;

R_1, R_2, R_5 and R_6 each is hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl or mercapto-lower alkylene;

R_4 is hydrogen, lower alkanoyl, benzoyl or



X is S, SO, or SO_2; and

p is 0 or 1;

or a basic salt thereof; wherein the terms lower alkyl, lower alkoxy and lower alkylene refer to groups having 1 to 7 carbon atoms and the term lower alkanoyl refers to groups having up to 7 carbon atoms; and a pharmaceutically acceptable vehicle therefor.

4,192,879

IMIDAZOLYL ALKYLAMINO NITROETHYLENE COMPOUNDS

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City; Geoffrey R. Owen, High Wycombe, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

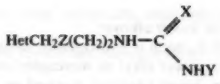
Division of Ser. No. 686,185, May 13, 1976, Pat. No. 4,098,898. This application Mar. 31, 1978, Ser. No. 892,232

Claims priority, application United Kingdom, May 21, 1975, 21817/75; Nov. 20, 1975, 47728/75

Int. Cl.[2] C07D *233/64;* **A61K** *31/415*

U.S. Cl. 424—273 R **10 Claims**

1. A compound of the formula:



wherein X is $CHNO_2$; Y is amino, lower alkylamino, di(lower alkyl)amino, lower alkoxy, phenylethyl, imidazolylethyl, allyl, 2,2,2-trifluoroethyl, or $(CH_2)_nR$; Z is sulphur or methylene; Het is an imidazole ring which is attached at a ring carbon and which ring is optionally substituted by lower alkyl or halogen; n is an integer from 1 to 12; and R is hydroxy, lower alkoxy, amino or lower alkylamino; or a pharmaceutically acceptable acid addition salt thereof.

10. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,192,880

2-SUBSTITUTED BENZIMIDAZOLE COMPOUNDS

Goro Tsukamoto, Toyonaka; Koichiro Yoshino, Settsu; Toshihiko Kohno, Sakai; Masahiro Taguchi, Settsu; Katsumi Dezawa, Settsu; Hajime Kagaya, Settsu; Keizo Ito, Osaka, and Takashi Nose, Suita, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

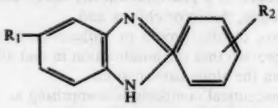
Division of Ser. No. 856,969, Dec. 2, 1977. This application Oct. 10, 1978, Ser. No. 949,429

Claims priority, application Japan, Apr. 7, 1977, 52-40072

Int. Cl.[2] A61K *31/415;* **C07D** *235/08*

U.S. Cl. 424—273 R **12 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy and R_2 is ethyl or tert-butyl.

7. A pharmaceutical composition for use in treating inflammation comprising an anti-inflammatory effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

4,192,881

CARBOXYALKYLACYL SUBSTITUTED IMIDAZOLYLAMINO ACIDS

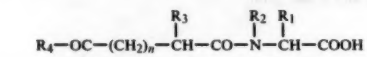
Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 903,288, May 4, 1978, which is a division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application Nov. 20, 1978, Ser. No. 962,533

Int. Cl.[2] C07D *233/64;* **A61K** *31/415*

U.S. Cl. 424—273 R **14 Claims**

1. A compound of the formula



and salts thereof, wherein

R_1 is imidazolyl-lower alkylene

R_2 is hydrogen or lower alkyl;

R_3 is lower alkyl or phenyl-lower alkylene;

R_4 is hydroxy, lower alkoxy or hydroxyamino; and n is 1 or 2.

14. A composition useful in reducing or relieving angiotensin related hypertension in a mammalian specie comprising about 10 to 500 mg. of a compound of claim 1 and a physiologically acceptable vehicle therefor.

4,192,882

CARBOXYALKYLACYLAMINO ACIDS

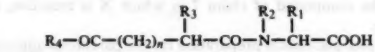
Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application May 4, 1978, Ser. No. 903,340

Int. Cl.[2] A61K *31/405;* **C07D** *209/20*

U.S. Cl. 424—274 **12 Claims**

1. A compound of the formula



and physiologically acceptable salts thereof, wherein

R_1 is 3-indolyl-lower alkylene;
R_2 is hydrogen or lower alkyl;
R_3 is lower alkyl or phenyl-lower alkylene;
R_4 is hydroxy, lower alkoxy or hydroxyamino; and
n is 1 or 2.

12. A composition for relieving angiotensin related hypertension in mammalian species suffering therefrom having 10 to 500 mg. of a compound of claim **1** and a physiologically acceptable vehicle therefor.

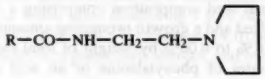
4,192,883

AMIDES OF PYRROLIDINOETHYLAMINE WHICH CAN BE USED IN LUNG THERAPY

Henri Cousse; Bernard Bonnaud; Jean-Pierre Tarayre, and Silvano Casadio, all of Castres, France, assignors to Pierre Fabre, S.A., France

Division of Ser. No. 714,764, Aug. 16, 1976, Pat. No. 4,122,199. This application Aug. 7, 1978, Ser. No. 931,489
Claims priority, application France, Apr. 9, 1976, 76 10754
Int. Cl.[2] A61K *31/40;* **C07D** *295/14*
U.S. Cl. 424—274 **9 Claims**

1. A compound selected from the group consisting of (a) a pyrrolidinoethylamine amide of the formula:



wherein

is an acyl radical of 9-fluorenecarboxylic acid, and (b) a pharmaceutically acceptable acid addition salt thereof.

7. Method for the treatment of a patient suffering from cough, comprising administering to the patient a compound of claim **1** in an amount effective for the alleviation of said condition.

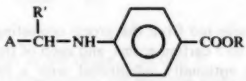
4,192,884

SUBSTITUTED 4-(((THIENYL)METHYL)-AMINO)BENZOIC ACIDS AND A METHOD FOR TREATING HYPOLIPIDEMIA

Eugene R. Wagner, Carmel, and Donald P. Matthews, Indianapolis, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

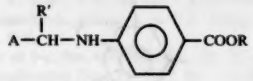
Continuation-in-part of Ser. No. 785,467, Apr. 7, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 915,049
Int. Cl.[2] C07D *333/20;* **A61K** *31/38*
U.S. Cl. 424—275 **27 Claims**

1. A compound of the formula:



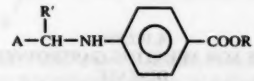
wherein R represents hydrogen or a lower alkyl having from one to about three carbon atoms; R′ represents hydrogen or methyl; and A represents halo-substituted thienyl with 1, 2 or 3 halo substitutions being present on the thienyl ring and further including the pharmaceutically-acceptable salts thereof.

10. A method for lowering serum lipid levels in a mammal which comprises administering internally to the mammal an effective hypolipidemic amount of a compound having the formula:



wherein R represents hydrogen or a lower alkyl having from one to about three carbon atoms; R′ represents hydrogen or methyl; and A represents halo-substituted thienyl with 1, 2 or 3 halo substitutions being present on the thienyl ring and further including the pharmaceutically-acceptable salts thereof.

20. A hypolipidemic composition comprising a suitable pharmaceutical carrier and an effective hypolipidemic amount of a compound having the formula:



wherein R represents hydrogen or a lower alkyl having from one to about three carbon atoms; R′ represents hydrogen or methyl; and A represents halo-substituted thienyl with 1, 2 or 3 halo substitutions being present on the thienyl ring and further including the pharmaceutically-acceptable salts thereof.

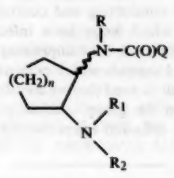
4,192,885

ANALGESIC N-{2-[N′-(2-FURYLMETHYL AND 2-THIENYL-METHYL)-N′-ALKYLAMINO]CYCLOALIPHATIC}-CYANOBENZAMIDES

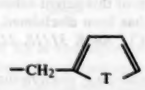
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 904,477, May 10, 1978, Pat. No. 4,148,914, which is a division of Ser. No. 741,467, Nov. 12, 1976, Pat. No. 4,098,904. This application Mar. 8, 1979, Ser. No. 18,550
Int. Cl.[2] A61K *31/34, 31/38;* **C07D** *307/54, 333/24*
U.S. Cl. 424—275 **6 Claims**

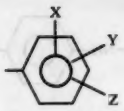
1. A compound of the formula



wherein the wavy line (~) at the 1-position of the cycloaliphatic ring denotes trans-stereoconfiguration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring;
n is 1 to 8;
R is hydrogen or C_1 to C_3-alkyl;
R_1 is C_1 to C_3-alkyl;
R_2 is a group of the formula



wherein T is —O— or —S—;
Q is the radical



wherein one of X, Y and Z is cyano and the remaining members of X, Y and Z are hydrogen, and the pharmaceutically acceptable salts thereof.

5. A method for alleviating pain in a warm blooded animal which comprises administering to the warm blooded animal suffering pain a compound of claim 1 in an amount effective to relieve the pain.

4,192,886

METHODS FOR TREATING GASTROINTESTINAL DISEASE

Richard G. Towlerton, Burton Joyce, England, and Michel Lapras, Ecully, France, assignors to Fisons Limited, London, England

Filed May 19, 1978, Ser. No. 907,558

Claims priority, application United Kingdom, Jun. 1, 1977, 23067/77; Aug. 12, 1977, 33847/77

Int. Cl.[2] A61K *31/52, 31/42, 31/35*

U.S. Cl. 424—283 **17 Claims**

1. A method for curative treatment of a disease condition of the gastrointestinal tract, which condition has an infective, viral, or hypersensitive aetiology, in cattle or pigs, which comprises administering an active ingredient having sodium cromoglycate like activity to cattle or a pig suffering, from such a condition.

4,192,887

RUMINANT COCCIDIOSTATS

Grover D. Cloyd; Robert L. Miller, and Donald M. Lucas, all of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Jun. 8, 1978, Ser. No. 913,767

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 **4 Claims**

1. A method for combatting and controlling coccidiosis in ruminant animals which have been infected with coccidia parasites while at the same time improving the rate of weight gain per day of said animals which comprises orally administering to said animals in need thereof an effective amount of an agent selected from the group consisting of salinomycin, 4-methylsalinomycin, salts and esters thereof.

4,192,888

PHARMACEUTICAL COMPOSITIONS AND METHOD OF INHIBITING PHENYLETHANOLAMINE N-METHYLTRANSFERASE

William E. Bondinell, Cherry Hill, N.J., and Robert G. Pendleton, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

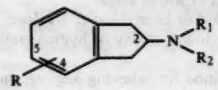
Filed Apr. 10, 1978, Ser. No. 894,664

The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.

Int. Cl.[2] A61K *31/18, 31/135*

U.S. Cl. 424—321 **5 Claims**

1. A method of inhibiting phenylethanolamine N-methyltransferase which comprises administering to an animal requiring said treatment an amount sufficient to produce said inhibition of a chemical compound of the formula:



in which:

R is chloro, bromo, fluoro, iodo, trifluoromethyl, nitro, sulfamyl or methylthio with R being in either the 4 or 5 position; and

R_1 and R_2 are hydrogen, methyl or ethyl.

4,192,889

RUMINANT FEEDS CONTAINING TRICHLOROETHYL ESTERS OF ESSENTIAL AMINO ACIDS

Frederic P. Hauck, Bridgewater, N.J.; Venkatachala L. Narayanan, Bethesda, Md.; Jeremiah J. O'Connor, Flemington, and Raymond R. Pilote, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 907,516, May 19, 1978. This application Jan. 8, 1979, Ser. No. 1,988

Int. Cl.[2] A61K *31/24*

U.S. Cl. 424—309 **8 Claims**

1. An animal feed composition comprising a conventional basic animal feed and a growth promoting amount in the range of about 0.001% to 0.06% by weight of total feed of the trichloroethyl ester of phenylalanine or an acid addition salt thereof.

4,192,890

NOVEL BENZOYLPHENYLACETIC ACID ESTERS

Andre Allais, Les Lilas; Jean Meier, Coeuilly-Champigny, and Jacques Dube, Eaubonne, all of France, assignors to Roussel Uclaf, Paris, France

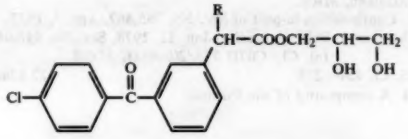
Continuation of Ser. No. 621,162, Oct. 9, 1975, abandoned, which is a continuation of Ser. No. 299,636, Oct. 20, 1972, abandoned, which is a division of Ser. No. 133,429, Apr. 12, 1971, Pat. No. 3,741,988. This application Feb. 28, 1979, Ser. No. 15,786

Claims priority, application France, Apr. 15, 1970, 70.13579; Sep. 24, 1970, 70.34591

Int. Cl.[2] A61K *31/215;* **C07C** *69/95*

U.S. Cl. 424—308 **6 Claims**

1. A member of the group consisting of racemates and optically active isomers of benzoylphenylacetic acid esters of the formula



wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 7 carbon atoms, and each of the two benzene rings may be optionally substituted with a member of the group consisting of chlorine, fluorine, bromine, trifluoromethyl and alkyl and alkoxy and alkylthio of 1 to 7 carbon atoms in the alkyl portion.

5. An anti-inflammatory and analgesic composition comprising an effective amount of a compound of claim 1 and a pharmaceutical carrier.

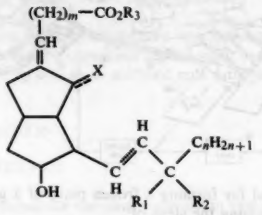
6. A method of relieving pain and inflammation in warm-blooded animals which comprises administering to warm-blooded animals a safe and effective amount of a compound of claim 1.

4,192,891
PROSTACYCLIN ANALOGS AND THEIR USE IN INHIBITION OF ARACHIDONIC ACID-INDUCED PLATELET AGGREGATION AND BRONCHOCONSTRICTION

Martin F. Haslanger, Lambertville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 25, 1979, Ser. No. 33,368
Int. Cl.[2] C07C *177/00, 69/38, 69/74*
U.S. Cl. 424—305 22 Claims

1. A compound of the structure



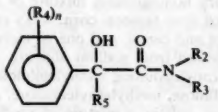
wherein=X represents =O or —OH, R_1 and R_2 are OH or H, provided at least one of R_1 and R_2 is other than hydroxyl, R_3 is hydrogen or lower alkyl containing 1 to 4 carbons, m is an integer of from 2 to 5, and n is an integer of from 2 to 10, and pharmaceutically acceptable salts thereof, and isomers thereof.

4,192,892
AROMATIC α-HYDROXYAMIDES WITH INSECT REPELLENT PROPERTIES

Walborg Thorsell, 45 Karlskronavagen, Johanneshov, Sweden (S-121 52); Maarja Mikiver, 46 Hagalundsgatan, Solna, Sweden (S-171 50); Elisabeth Malm, 8 Gaddvagen, Järfälla, Sweden (S-175 47), and Lennart Wennberg, 51 Rankhusvägen, Kungsängen, Sweden (S-196 31)

Continuation of Ser. No. 784,563, Apr. 4, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 925,975
Claims priority, application Sweden, Apr. 6, 1976, 7604030
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—324 8 Claims

1. An insect repellent composition comprising an effective amount of a compound present in the D-, L-, or DL-forms, having the general formula



(I)

wherein,

n is an integer in the range from 0 to 3;

R_2 and R_3 independently are selected from the group consisting of hydrogen, alkyl having from 1 to about 10 carbon atoms, and alkenyl having from two to about 10 carbon atoms;

R_4 is selected from the group consisting of hydroxy, lower alkyl having from 1 to about 5 carbon atoms, and lower alkoxy having from 1 to about 5 carbon atoms; and,

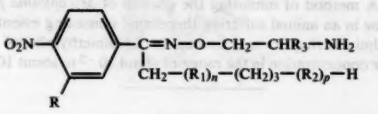
R_5 is selected from the group consisting of hydrogen, lower alkyl having from 1 to about 5 carbon atoms, and lower alkoxy having from 1 to about 5 carbon atoms.

4,192,893
ANTI-DEPRESSIVE COMPOUNDS

Hendricus B. A. Welle, Utrecht, and Volkert Claassen, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 668,492, Mar. 19, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,603
Claims priority, application Netherlands, Mar. 20, 1975, 7503307
Int. Cl.[2] A61K *31/15;* C07C *131/00*
U.S. Cl. 424—327 14 Claims

1. Compounds of formula



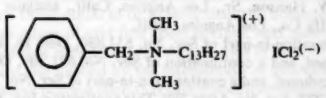
and salts thereof with pharmaceutically acceptable acids, in which formula R is hydrogen, chlorine or methyl, R_1 is oxygen or sulphur, R_2 is OCH_2, CH_2OCH_2 or $OC_2H_4OCH_2$, R_3 is hydrgen or methyl, n and p have the value 0 or 1 and n+p is 0 or 1.

4,192,894
COMPOUND WITH DISINFECTANT ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Claudio Botré; Franco Bolasco; Adriana Memoli, all of Rome, and Luigi Molteni, Malnate, all of Italy, assignors to Dr. L. Zambeletti S.p.A., Baranzate, Italy

Filed Aug. 31, 1977, Ser. No. 829,586
Claims priority, application Italy, Aug. 7, 1977, 41006 A/77
Int. Cl.[2] C07C *87/68;* A01N *9/16*
U.S. Cl. 424—329 2 Claims

1. Benzalkonium chloroiodite, a compound of the formula:

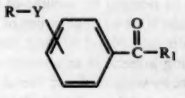


4,192,895
ANTIRHINOVIRUS AGENTS

Roger A. Parker, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 751,140, Dec. 20, 1976, Pat. No. 4,122,191. This application Jul. 31, 1978, Ser. No. 929,256
Int. Cl.[2] A61K *31/12, 31/11*
U.S. Cl. 424—331 12 Claims

1. A method for prophylaxis or treatment of a rhinovirus infection which comprises administering to a host susceptible to rhinovirus infection an antirhinovirus effective amount of a compound of the formula



wherein Y is a bond; R_1 is hydrogen or straight or branched lower alkyl having from 1 to 4 carbon atoms; and R is straight or branched saturated hydrocarbon having from 6 to 20 carbon atoms or straight or branched unsaturated hydrocarbon having from 6 to 20 carbon atoms and from 1 to 4 double bonds when

R has from 10 to 20 carbon atoms and 1 or 2 double bonds when R has from 6 to 9 carbon atoms.

4,192,896

METHOD OF USING DIALKYLPHENOLS IN THE TREATMENT OF MYCOPLASMA DISEASES

Byron E. Leach, deceased, late of Memphis, Tenn., and by Elanor L. Leach, executrix, 1550 N. Parkway #115, Memphis, Tenn. 38112

Filed Mar. 23, 1979, Ser. No. 23,254
Int. Cl.[2] A61K 31/05
U.S. Cl. 424—346 2 Claims

1. A method of inhibiting the growth of *Mycoplasma pneumoniae* in an animal suffering therefrom, consisting essentially of administering to said animal to 2,4-dimethylphenol in a molar concentration in the range of about 10^{-5} to about 10^{-11}.

4,192,897

HEAT TREATMENT FOR SINGLE-CELL MATERIALS AND RESULTANT PRODUCTS

Shingo Kajinami, Naperville; Elmer J. Saunders, Downers Grove, and Philip G. Schnell, Wheaton, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 725,021, Sep. 20, 1976, abandoned. This application Apr. 29, 1977, Ser. No. 792,321
Int. Cl.[2] C12B 1/00; A23J 1/18
U.S. Cl. 426—60 26 Claims

1. A process for treating whole single-cell protein cells consisting essentially of heating an aqueous slurry of the cells to a temperature of from about 215° to about 300° F. for a period of time of from about 30 seconds to about 25 minutes to deactivate invertase whereby heat treated whole cells are obtained having improved functional properties.

4,192,898

STABLE CLEAR LIQUID RELEASE AGENT AND METHOD FOR PREPARATION

Harold W. Hanson, Sr., Los Angeles, Calif., assignor to Par-Way Mfg Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 532,850, Dec. 16, 1974, abandoned, and a continuation of Ser. No. 621,309, Oct. 10, 1975, abandoned, and a continuation-in-part of Ser. No. 772,929, Feb. 28, 1977, Pat. No. 4,096,258. This application Jun. 16, 1978, Ser. No. 916,116
Int. Cl.[2] A23D 5/00
U.S. Cl. 426—250 14 Claims

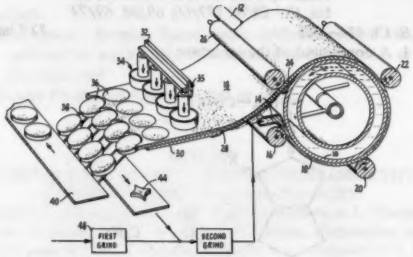
1. A method for preparing a stable clear liquid release agent comprising a uniform liquid blend of fatty oils and Polysorbate 80, the method comprising the steps of heating and blending at a temperature of between about 65° C. and about 260° C. at least two fatty oils, said oils including a first oil selected from a group consisting of palm oil, coconut oil and palm kernel oil and mixtures thereof, said first oil being present in an amount of from about 15 to about 41 percent by weight of said blend, and a second oil selected from the group consisting of olive oil, cottonseed oil, peanut oil, sunflower seed oil, corn oil, herring oil, manhaden oil, pilchard oil, and fish liver oil and mixtures thereof, said second oil being present in an amount of from about 58 to about 84 percent by weight of said blend; further blending Polysorbate 80 at a temperature of between about 74° C. and 85° C. with said blend of first and second oils said Polysorbate 80 being present in an amount of from about 0.25 to about 2.0 percent by weight of said blend; chilling said blend of the first and second oils and said Polysorbate 80 to uniformly cool said blend to a temperature of between about 20° C. and about 25° C., working said chilled blend by high speed agitation to provide a clear liquid release agent and packaging said release agent with a CO_2 propellant in an amount of from about 3.0 to about 5.0 percent by weight of said blend.

4,192,899

METHOD FOR FORMING FROZEN MEAT PATTIES

Eldon N. Roth, 1025 Tennessee St., San Francisco, Calif. 94107

Division of Ser. No. 778,492, Mar. 17, 1977, Pat. No. 4,138,768. This application Sep. 11, 1978, Ser. No. 941,304
Int. Cl.[2] A23P 1/00
U.S. Cl. 426—513 7 Claims



1. A method for forming a frozen patty of a ground meat product comprising the steps of:

mixing together the components of the desired meat product;

applying said product to the outer surface of a rotating refrigerated drum;

compressing said applied product with at least one compression roll mounted on an axis parallel with the axis of said drum and spaced from the surface by a distance corresponding to the desired thickness of the patty to be formed;

stripping the sheet of frozen meat product from the drum surface with a scraper bar mounted adjacent said surface;

passing said sheet to a patty-forming table by continuously sliding said sheet to said table from the drum as the product is stripped from the drum; and,

forming patties from the sheet of frozen meat product by actuating at least one bank of reciprocating cutters positioned across the path of said sheet and arranged to punch through the frozen meat product in said sheet.

4,192,900

TEXTURIZED STARCH PRODUCTS

Hsiung Cheng, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 12, 1978, Ser. No. 950,634
Int. Cl.[2] A32L 1/187
U.S. Cl. 426—579 18 Claims

1. In a retorted or aseptically packaged, tapioca-style pudding, the improvement comprising uniform starch particles obtained by

(a) preparing a dry homogeneous mixture of one or more starches selected from tapioca, corn, waxy maize, potato, sago, arrowroot and cereal; and one or more gelling hydrocolloids selected from sodium alginate, sodium pectate, hydroxypropylcellulose, methylcellulose, methylhydroxypropylcellulose, methylethylcellulose, carrageenan, furcellaran, agar, gelatin, a mixture of xanthan gum and locust bean gum, and curdlan;

(b) adding water and mixing until smooth;

(c) cool extruding the mixture through a 1/32 to ¼ inch hole die and cutting to produce starch particles;

(d) where the gelling hydrocolloid selected is sodium alginate or sodium pectate, soaking the starch particles in a solution of calcium, barium, or magnesium ions;

(e) drying the starch particles to a moisture content of from 1 to 12%; and

(f) screening the starch particles to pass No. 10 and be retained by No. 14, U.S. Standard Sieve Series;

said starch particles having heat and shear stability during processing for retorting or aseptic packaging, yet swelling

without dissolving during said processing to produce a tapioca-style pudding of improved tapioca-like appearance and texture.

4,192,901

MILK-CONTAINING ACID SYRUP

Mutsuo Yasumatsu; Shinichi Shoji; Koichi Sakamoto; Takao Kurihara, all of Tokyo; Takeshi Terabayashi, Misato, and Kasutaka Ohmura, Kashiwa, all of Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,874
Int. Cl.[2] A23C *3/02, 9/10, 9/12*
U.S. Cl. 426—580 **20 Claims**

1. A method for the manufacture of a milk-containing acid syrup, which method comprises adding sugar in the amount of from 20 to 52 w/w% to an acidified milk satisfying the conditions:

$$0.85 \leqq x \leqq 2.55$$

$$y \leqq -0.27x + 4.15$$

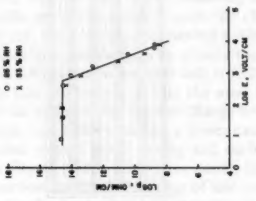
(wherein, x stands for the casein content in said acidified milk (w/w%) and y for the pH value of the acidified milk) and subjecting the sugar-added acidified milk to an ultra-high temperature heating at 100° C. to 160° C.

4,192,902

IN SITU COATING THEN SPRAY DRYING OF MAGNETIC TONER

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 792,635
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—127 **26 Claims**



1. A process of making a field dependent toner having a resistivity greater than 10^{12} ohm-cm at fields less than 100 volts/cm and less than 10^{12} ohm-cm at fields greater than 100 volts/cm comprising applying a surfactant to magnetic pigment particles, the surfactant being present on the magnetic pigment in an amount of from about 0.1 to 10 percent by weight of the magnetic pigment, spray drying a dispersion of the thus coated magnetic pigment particle in a solution of a resin in a solvent and recovering the toner particles thus formed.

7. A process of making a field dependent toner having a resistivity greater than 10^{12} ohm-cm at fields less than 100 volt/cm and less than 10^{12} ohm-cm at fields greater than 100 volt/cm comprising forming a dispersion of surfactant and magnetic particles in a solvent, heating to reflux, adding a solution of resin and solvent, spray drying and recovering toner particles, the surfactant being present as a coating on the magnetic pigment in the amount of from between about 0.1 and 10 percent by weight based on the weight of the magnetic pigment.

4,192,903

TWO PIECE ORNAMENT

Joseph A. Tremblay, Riverside, R.I., assignor to The Lorac Company, Providence, R.I.

Filed Oct. 2, 1978, Ser. No. 948,769
Int. Cl.[2] A47G *33/08*
U.S. Cl. 428—8 **10 Claims**

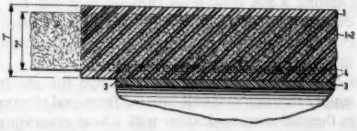
1. An ornament comprising first and second sheets having opposed substantially planar surfaces, each said sheet having a peripherally defined ornamental outline, said first sheet including a vertically orientated continuous slot disposed relative thereto so as to divide said first sheet into laterally opposite sides, said slot further respectively terminating at upper and lower ends thereof in upper and lower connecting bridges each in turn including a lower edge, said bridges in turn connecting said opposite sides of said first sheet together, said second sheet also having laterally opposite sides disposed to both sides of a vertically orientated second sheet portion in turn respectively terminating at upper and lower opposite ends thereof in upper and lower pockets, an adjacent portion of said lower pocket of said second sheet being a hook or finger extension means, each of said pockets having a lead-in opening and a base seat disposed vertically below at least the uppermost surface portions of its corresponding lead-in opening, at least one of said base seats adapted to receive and support the lower edge of said corresponding bridge of said first sheet, the length of said slot being greater than the distance between the uppermost surfaces of said lead in openings and the distance between said base seats being equal to or greater than the distance between the lower edges of said first sheet bridges, said sheets adapted for disposition substantially at right angles to each other along a juncture line formed by the intersection of said slot and said second sheet portion such that said respective opposite sides of said sheets radiate outwardly from said juncture line when said sheets are interconnected with said first sheet supported by said second sheet.

4,192,904

TUBULAR PACKAGING MATERIAL

Günter Gerigk, Oberursel; Wolfgang Klendauer, Wiesbaden; Horst Pietruck, Schwabenheim, and Klaus-Dieter Hammer, Mainz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 669,811, Mar. 24, 1976, abandoned.
This application Jan. 26, 1978, Ser. No. 872,696
Int. Cl.[2] B32B *27/06, 23/04*
U.S. Cl. 428—36 **3 Claims**



1. A tube based on regenerated cellulose containing a portion of water and plasticizer and having on its surface a coating composed of a mixture of a first and a second copolymer in a ratio of 1:1 to 4:1, the first copolymer consisting of 90 percent

by weight of vinylidene chloride, 1 percent by weight of acrylic acid, and 9 percent by weight of acrylic acid methyl ester, and the second copolymer consisting of 85 percent by weight of vinylidene chloride, 2 percent by weight of acrylic acid, 6 percent by weight of acrylic acid methyl ester, and 7 percent by weight of acrylic acid butyl ester.

4,192,905

IMITATION BEVEL EDGING

Thomas P. Scheibal, 407 Francisco St., San Francisco, Calif. 94133

Filed Aug. 5, 1977, Ser. No. 822,314
Int. Cl.[2] B29D *11/00*; B32B *7/12, 17/10*
U.S. Cl. 428—80 **18 Claims**

1. A simulated bevel edge for the surface of a sheet body and the like, comprising:

a transparent elongated strip of polymeric material having a surface adapted for mounting on a sheet body adjacent the periphery of a designated area thereof, and adhesion means for securing said strip in place,

said strip having an opposite surface disposed at an acute angle to said first named surface,

whereby incident or transmitted light is reflected or refracted in such manner that the area of said sheet body covered by said strip appears to be beveled with respect to the inward adjacent area of said sheet body.

3. A simulated bevel edge as claimed in claim 1, and wherein said sheet body is a mirror.

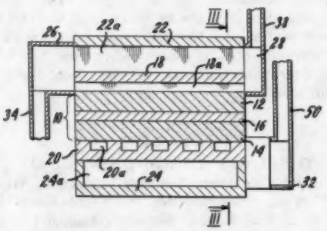
4. A simulated bevel edge as claimed in claim 3, and wherein said opposite surface of said strip is reflective to a degree approximating the reflectivity of said mirror.

4,192,906

ELECTROCHEMICAL CELL OPERATION AND SYSTEM

Hansraj C. Maru, Brookfield Center, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Jul. 10, 1978, Ser. No. 923,368
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—13 **17 Claims**



1. A method for operating an electrochemical cell to produce electrical energy from an electrochemical reaction wherein a gas is supplied from a gas supply to a flow passage in said cell in communication with the cell electrolyte, including the steps of:

(a) setting a gas flow level through said cell for gas conducted through such electrolyte-communicative passage in accordance with predetermined electrical energy to be produced by said cell;

(b) establishing a further flow passage for gas from said supply through said cell isolated from said electrolyte and in thermal communication with a heat-generating surface of said cell; and

(c) setting a gas flow level through said cell for gas conducted through such electrolyte-isolated passage to obtain a predetermined operating temperature range for said cell.

4,192,907

ELECTROCHEMICAL CELL ELECTRODES INCORPORATING NOBLE METAL-BASE METAL ALLOY CATALYSTS

Vinod M. Jalan, Manchester; Douglas A. Landsman, and John M. Lee, both of West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1978, Ser. No. 922,003
Int. Cl.[2] H01M *8/08*
U.S. Cl. 429—40 **10 Claims**

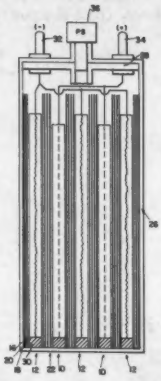
1. A fuel cell including phosphoric acid electrolyte and a cathode electrode, said electrode comprising an electrically conductive substrate and a layer of catalyst disposed on said substrate, said catalyst comprising a finely divided platinum-base metal alloy supported on conductive particles, said alloy having a catalytic activity for the reduction of oxygen greater than the catalytic activity of supported platinum in unalloyed form, and a surface area of at least 30 m^2/g of platinum in the alloy.

4,192,908

MASS-TRANSPORT SEPARATOR FOR ALKALINE NICKEL-ZINC CELLS AND CELL

Albert Himy, University Park, Md., and Otto C. Wagner, Long Branch, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 15, 1979, Ser. No. 48,878
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—53 **27 Claims**



1. A mass-transport separator for fully vented alkaline nickelzinc cells comprising

(1) a barrier layer comprising a microporous polyolifin membrane which is coated with a layer of from 50 Å to 1000 Å of a low hydrogen overpotential material having a hydrogen overpotential in alkaline solution lower than that of zinc;

(2) two protective layers comprising microporous polyolifin membranes;

the barrier layer being sandwiched between and in contact with the two protective layers.

19. A sealed alkaline nickel-zinc cell which comprises:

A. a nickel-nickel hydroxide cathode;

B. a zinc-zinc oxide anode;

C. a mass-transport separator comprising:

(1) a barrier layer comprising:

(a) a microporous polyolifin membrane which is coated with a layer of from 50 Å to 1000 Å of low hydrogen overpotential material having a hydrogen overpotential in alkaline solution lower than that of zinc, and

(b) a semipermeable active layer of hydroxyl-containing

polymer covering the layer of low hydrogen overpotential material;

(2) two protective layers comprising microporous polyolifin membranes,

the barrier layer being sandwiched between the two protective layers;

D. an alkaline electrolyte;

E. means for terminating the charging of the cell when the internal gas pressure of the cell reaches a preselected value; and

F. means for venting the cell if the internal gas pressure reaches a preselected value above that at which the charging of the cell is terminated.

4,192,909

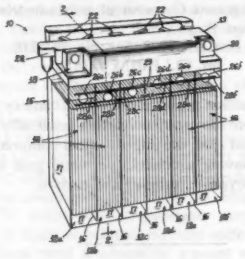
MOTORCYCLE BATTERY INDICATOR

Kenneth W. McElroy, 611 Bradley Dr., Bloomington, Ill. 61701

Filed Jun. 16, 1978, Ser. No. 916,142

Int. Cl.[2] H01M *10/48*

U.S. Cl. 429—91 **8 Claims**



1. A storage battery for motorcycles comprising a plurality of storage cells, each of said cells containing an electrolyte having a specific gravity dependent upon the charge level of the associated cell, each of said cells having a solid, visible and movable mass, with a specific gravity greater than the specific gravity of said electrolyte when said cell is fully discharged, for floating in said electrolyte so that the mass floats toward the bottom of the cell as either the cell charge level or electrolyte level drops; said battery having a lower casing and a top portion attached to said lower casing and each of said cells having a plurality of plates; said lower casing having a transparent wall portion so that the location of said mass within the cell may be visually inspected; said plurality of masses being physically confined only by said top portion, said lower casing transparent portion and said plates so that each movable mass feeely moves within a cell so that as the charge level or electrolyte level of a cell drops, the mass associated with the cell floats down toward the plates of that cell; each of said masses being of a sufficient size to rest on said plates without falling therebetween.

4,192,910

CATALYST SURFACES FOR THE CHROMOUS/CHROMIC REDOX COUPLE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Jose D. Giner, and Kathleen J. Cahill, both of Waltham, Mass.

Filed Nov. 29, 1978, Ser. No. 964,754

Int. Cl.[2] H01M *8/18*

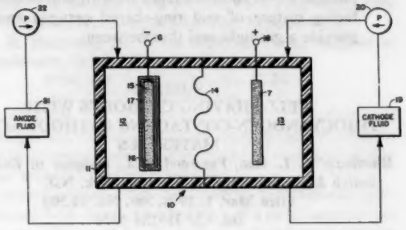
U.S. Cl. 429—101 **14 Claims**

1. A REDOX cell having first and second chambers separated by an ion permeable membrane; an anode fluid in the first chamber; and

a cathode fluid in the second chamber;

an anode electrode in said first chamber, said electrode being electrically conductive but inert with respect to the anode fluid;

a cathode electrode in said second chamber, said electrode



being electrically conductive but inert with respect to the cathode fluid, said anode fluid having lead chloride salt dissolved therein whereby lead is plated onto the anode electrode when the cell is initially charged.

4,192,911

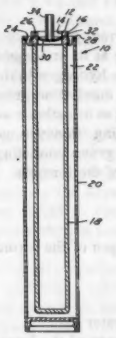
SODIUM SULFUR BATTERY SEAL

Armenag Topouzian, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 1, 1978, Ser. No. 956,758

Int. Cl.[2] H01M *2/00*

U.S. Cl. 429—104 **4 Claims**



1. In a sodium sulfur battery an improved seal for sealing against a ceramic member which acts as a separator between an anode compartment and a cathode compartment, which improved seal includes the following structure:

an outer metal can member of circular cross section having an open end;

a ring-shaped flexible diaphragm seal having an inner circumferential edge and an outer circumferential edge, said flexible diaphragm seal having a generally "U" shaped cross section between its circumferential edges to provide resiliency thereto, said outer circumferential edge of said flexible diaphragm being bonded in a gas tight relationship to said open end of said outer can member;

a ring-shaped ceramic member having a smooth, inner facing surface and a smooth, outer facing surface, said inner circumferential edge of said flexible diaphragm seal being slightly less in diameter than the diameter of said outer facing surface of said ring-shaped ceramic member whereby said inner circumferential edge of said flexible diaphragm forms an interference fit with said smooth, outer facing surface of said ring-shaped ceramic member to provide a gas tight seal therebetween; and

a disc-shaped inner flexible diaphragm seal having a curved

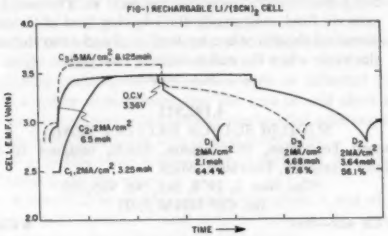
cross section and an outer diameter slightly greater in diameter than the diameter of said smooth, inner facing surface of said ring-shaped ceramic member whereby said outer circumferential edge of said inner flexible diaphragm forms an interference fit with said smooth, inner facing surface of said ring-shaped ceramic member to provide a gas tight seal therebetween.

4,192,912

CELLS HAVING CATHODES WITH THIOCYANOGEN-CONTAINING CATHODE-ACTIVE MATERIALS

Bhaskara M. L. Rao, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 1, 1979, Ser. No. 16,503
Int. Cl.[2] H01M 6/16
U.S. Cl. 429—105 **10 Claims**



1. An electric current-producing cell, comprising:

(a) an anode having as its anode-active material one or more metals higher than hydrogen in the electromotive series and having an atomic number no greater than 30;

(b) a cathode having as its cathode-active material one or more materials containing thiocyanogen, said materials being selected from the group consisting of:

(i) thiocyanogen of the formula:

$(SCN)_2$;

(ii) parathiocyanogen of the formula:

$(SCN)_x$

wherein x is greater than 2;

(iii) halothiocyanogen of the formula:

YSCN

wherein Y is a halogen selected from the group consisting of F, Cl, Br and I;

(iv) parahalothiocyanogen of the formula:

$(YSCN)_y$

wherein Y is as described above and wherein y is equal to or greater than 2;

(v) perthiocyanogen complex of an amine;

(vi) perthiocyanogen complex of ammonium cation;

(vii) thiocyanogen complex of a metal cation which is the same as the metal cation in the anode;

(viii) thiocyanogen complex of a metal cation which is higher in the electromotive series than the metal cation in the anode;

(ix) cathode intercalated material having halothiocyanogen of paragraph (iii) above intercalated therein;

(x) cathode intercalated material having parahalothiocyanogen of paragraph (iv) above intercalated therein;

(xi) polymeric thiocyanogen-containing material obtained from oxidation of a polyvinyl thiocyanate;

(xii) ammonium thiocyanate salt complex of thiocyanogen of paragraph (i) above;

(xiii) ammonium thiocyanate salt complex of parathiocyanogen of paragraph (ii) above;

(xiv) ammonium thiocyanate salt complex of halothiocyanogen of paragraph (iii) above; and

(xv) ammonium thiocyanate salt complex of parahalothiocyanogen of paragraph (iv) above; and

(c) an electrolyte which is chemically inert with respect to said anode and said cathode and which permits the migration of ions between anode and said cathode.

4,192,913

DEFERRED ACTION BATTERY HAVING AN IMPROVED DEPOLARIZER

Ralph F. Koontz, and Lloyd E. Klein, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Nov. 27, 1978, Ser. No. 963,718
Int. Cl.[2] H01M 4/36
U.S. Cl. 429—119 **11 Claims**

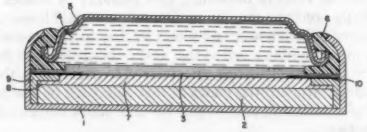
1. A deferred action seawater activated battery having an anode selected from the group consisting essentially of magnesium, aluminum and zinc, the improvement comprising a cathode depolarizer having a conductive metal grid and coated with cuprous thiocyanate, sulphur and carbon.

4,192,914

LONG-LIFE ALKALINE PRIMARY BATTERY

Paul Rüetschi, Yverdon, Switzerland, assignor to Leclanche S.A., Yverdon, Switzerland

Filed Oct. 25, 1978, Ser. No. 954,577
Claims priority, application Switzerland, Apr. 30, 1976, 5477/76
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.[2] H01M 6/04
U.S. Cl. 429—206 **6 Claims**



1. In an alkaline primary battery of the type having a negative electrode containing cadmium or amalgamated zinc and a positive electrode containing an oxide of the group monovalent silver oxide, mercuric oxide and mixtures of these oxides with manganese dioxide, the positive electrode having an electrochemically active surface area facing said negative electrode, comprising at least one electrically conductive, microporous, electrolyte-saturated, optically opaque filter electrode which is designed such as to hinder effectively the diffusion of dissolved silver oxide and mercuric oxide in the electrolyte and has for this purpose a thickness of 0.1 to 2.00 mm, said filter electrode containing electrically conductive material which is not corroded, oxidized, nor dissolved in alkali electrolytes at the given potential of said positive electrode and is in electrical contact with said positive electrode.

4,192,915

ANTHRACYCLINE GLYCOSIDES FROM STREPTOMYCES

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Masa Hamada, Hoya; Masaaki Ishizuka; Hiroshi Naganawa, both of Tokyo; Toshikazu Oki, Kamakura, and Taiji Inui, Chigasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 823,052, Aug. 9, 1977, Pat. No. 4,127,714. This application Apr. 20, 1978, Ser. No. 898,065

Claims priority, application Japan, Aug. 16, 1976, 51/98113

Int. Cl.[2] C12D *9/14*

U.S. Cl. 435—78 **2 Claims**

1. A process for producing rhodirubin A which comprises cultivating a rhodirubin A producing strain of Streptomyces selected from the group consisting of *Streptomyces sp.* ME 505-HEI (ATCC 31273, FERM P-3667), *Streptomyces galilaeus* MA 144-M(ATCC 31133, FERM P-3667), (ATCC 14969), *Streptomyces cinereoruber* (ATCC 19740), *Streptomyces niveoruber* (ATCC 14971), *Streptomyces antibiotics* (ATCC 8663) and *Streptomyces purpurascens* (ATCC 25489) in an aqueous nutrient medium under submerged aerobic conditions until a substantial amount of rhodirubin A is produced by said organism in said culture medium and recovering the rhodirubin A from the culture medium substantially free of substances co-produced therewith.

2. A process for producing rhodirubin B which comprises cultivating a rhodirubin B-producing strain of Streptomyces selected from the group consisting of *Streptomyces sp.* ME 505-HEI (ATCC 31273, FERM P-3667), *Streptomyces galilaeus* MA 144-M (ATCC 31133, FERM P-3667), *Streptomyces galilaeus* (ATCC 14969), *Streptomyces cinereoruber* (ATCC 19740), *Streptomyces niveoruber* (ATCC 14971), *Streptomyces antibioticus* (ATCC 8663) and *Streptomyces purpurascens* (ATCC 25489) in an aqueous nutrient medium under submerged aerobic conditions until a substantial amount of rhodirubin B is produced by said organism in said culture medium and recovering the rhodirubin B from the culture medium substantially free of substances co-produced therewith.

4,192,916

PROCESS FOR PRODUCING DEFATTED HEPARIN TISSUE FOR HEPARIN PRODUCTION

William E. Melby; Charles E. Isdale, Sr., and Vernon K. Collins, all of Champaign, Ill., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 743,385, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,625, Oct. 31, 1975, abandoned. This application Apr. 5, 1978, Ser. No. 893,651

The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.

Int. Cl.[2] C12B *1/00;* **C08B** *37/10*

U.S. Cl. 435—274 **11 Claims**

1. A process for producing a defatted heparin tissue from frozen heparin-bearing animal lung tissue without addition of water, preservatives or enzymes in preparation for isolation of heparin and to maximize heparin availability which comprises the steps of

(1) particulating the frozen tissue,

(2) thawing the particulated tissue from step 1 in a heat exchanger and warming said tissue without added water or preservative to 60°–85° F. within 2 to 30 minutes using heat exchanger surfaces which do not exceed 140° F.,

(3) fermenting the warmed tissue from step 2 without added water or preservatives by spontaneous action of enzymes and bacteria endogenous to the tissue, no additonal enzymes or bacteria being added, by holding said tissue at a controlled temperature of 60°–85° F. for a period of time of 5–12 hours to substantially effect conditioning of said tissue to improve heparin availability, endogenous bacteria being allowed to grow without inhibition during said period of time, and

(4) subjecting the fermented tissue from step 3 to azeotropic distillation processing with a suitable solvent to substantially dehydrate and defat said fermented tissue.

4,192,917

PROCESS FOR ROSETTING HUMAN B LYMPHOCYTES WITH RHESUS MONKEY ERYTHROCYTE

Vincent R. Zurawski, Jr., North Reading, Mass., assignor to Massachusetts General Hospital, Boston, Mass.

Filed Apr. 5, 1979, Ser. No. 27,307

Int. Cl.[2] C12N *7/04;* **A61K** *39/00*

U.S. Cl. 435—236 **11 Claims**

1. The process for separating activated animal B lymphocytes that produce immunoglobulin from immunologically inactivate animal cells which comprises:

(a) exposing animal lymphocyte cells to a stimulation agent selected from the group consisting of a polyclonal activator, an antigen and T cell products induced by an antigen or a polyclonal activator which products normally induce B-cells to produce an antibody;

(b) incubating said cells exposed to said stimulation agent in order to induce at least some of the B lymophocyte cells of said stimulated cells to form a surface marker that binds with Rhesus monkey erythrocytes;

(c) contacting said stimulated cells with Rhesus monkey erythrocytes to effect binding thereof with said cells having said surface marker; and

(d) separating said cells bound to said erythrocytes from cells not bound with said erythrocyte.

4,192,918

PRODUCTION OF BAKER'S YEAST FROM ACID WHEY

Thomas L. Stineman; Jeffrey D. Edwards, both of Cincinnati, Ohio, and Jack C. Grosskopf, Wheaton, Ill., assignors to The Kroger Co., Cincinnati, Ohio

Filed Nov. 30, 1978, Ser. No. 964,990

Int. Cl.[2] C12N *1/18;* **C12C** *11/08*

U.S. Cl. 435—256 **9 Claims**

1. A process for treating acid whey liquid which contains suspended solids, proteins, lactose and water from the manufacture of fresh cheeses to reduce the organic nutrient content thereof, said process comprising the steps of:

(a) clarifying acid whey liquid to remove any suspended cheese particles contained therein and separating the thus-removed particles;

(b) filtering the clarified liquid and separating any remaining protein, leaving an acid whey substantially completely devoid of proteins and suspended solids;

(c) subjecting the acid whey liquid from step (b) to hydrolysis conditions thereby converting the lactose disaccharide present in the whey liquid into the corresponding glucose and galactose monosaccharides;

(d) sterilizing the acid whey liquid of step (c);

(e) adjusting the pH of the sterile liquid to about pH 5 then inoculating the sterile liquid with a culture of *Saccharomyces cerevisiae* yeast and maintaining the thus-inoculated liquid under yeast growth conditions at a temperature of about 28° C. to about 32° C. for a period of time until the glucose and galactose are substantially completely consumed by the yeast growth; and

(f) separating and removing the yeast produced in step (e) and discharging the remaining liquid.

4,192,919

BLOOD SAMPLING AND CULTURING KIT

Srinivas T. Raghavachari, Chicago, Ill., assignor to MPL, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 797,841, May 17, 1977, abandoned. This application Jul. 18, 1977, Ser. No. 816,371

Int. Cl.[2] A61M *5/315*

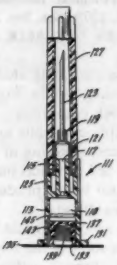
U.S. Cl. 435—292 **7 Claims**

1. A vent control device for use with a blood culture bottle

containing a culture medium and having a pierceable stopper sealing the bottle through which a blood sample may be injected, the vent control device including:

a tubular housing having a central bore with an opening at each end thereof,

a cannula connected to one end of the housing and projecting outwardly of the housing, for connecting the vent



control device to the interior of the bottle by piercing the bottle stopper without exposing the bottle contents to atmospheric contamination, and

a vent control element closing the opening at the opposite end of the housing, the vent control element including a thin sheet of an air permeable sterile filter material releasably adhered to the housing to permit removal thereof for subsequent subculturing.

4,192,920

UNIFORM POLYMER BEADS AND ION EXCHANGE RESINS THEREFROM PREPARED BY POST-CROSSLINKING OF LIGHTLY CROSSLINKED BEADS

David R. Amick, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 24, 1978, Ser. No. 927,195

Int. Cl.[2] **B01J** *1/22;* **C08F** *212/36;* **C08J** *3/24;* **C08F** *212/10*

U.S. Cl. 521—31 **12 Claims**

1. A strong base anion exchange resin produced by lightly crosslinking vinylaromatic polymer beads containing about 0.8–2.0 chloromethyl groups per aromatic nucleus, swelling the beads in an organic solvent post-crosslinking said lightly crosslinked swollen beads by reactive contact with a Friedel-Crafts catalyst, and aminating with a tertiary amine, wherein said lightly crosslinked polymer beads are formed by hydrolyzing said vinylaromatic polymer beads and heating said hydrolyzed beads in aqueous dispersion in the presence of a free radical initiator to obtain up to about 20% crosslinking.

4,192,921

CROSSLINKED GEL ION EXCHANGE RESIN BEADS CHARACTERIZED BY STRAIN BIREFRINGENCE PATTERNS

Mark J. Dales, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

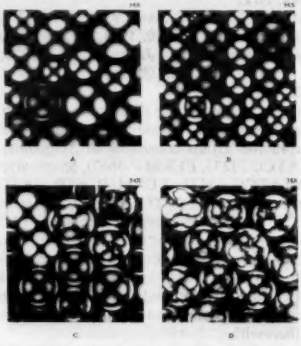
Filed Dec. 28, 1977, Ser. No. 865,273

Int. Cl.[2] **C08F** *00/00;* **B01D** *15/04*

U.S. Cl. 521—38 **33 Claims**

1. Ion exchange resin bead having high perfect bead count, improved mechanical strength and resistance to swelling pressures comprising functionalized crosslinked gel copolymer beads of a minor amount of a polyvinyl aromatic hydrocarbon monomer, up to 5 mole percent of a non-aromatic monomer and the remainder a monovinyl aromatic hydrocarbon monomer, said beads having a birefringence pattern corresponding substantially to at least one of FIG. IA, B, C or D when the beads are cationic and swollen in water and corresponding substantially to at least one of FIGS. IIIA, B or C when the beads are anionic and swollen to equilibrium in ethanol, said beads further having a Chatillon value of greater than 900 g/bead in the case of a cationic resin and greater than 600 g/bead in the case of an anionic resin.

18. In the process of preparing hard, crosslinked, discrete copolymer beads by the free-radical polymerization in an aqueous dispersion of a monomer mixture comprised of about



80–99% by weight of the mixture of monovinyl aromatic monomer and about 1–20% by weight of the mixture of a crosslinking monomer having at least two active vinyl groups, the improvement which comprises conducting the polymerization reaction at a temperature within the range of about 30°–95° C. with oxygen in contact with or dissolved in the monomer mixture, or a combination of both.

4,192,922

FINELY DIVIDED EXPANDABLE STYRENE POLYMERS

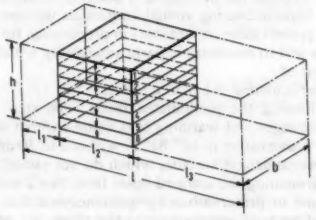
Johann Mixich, and Horst Jastrow, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,275

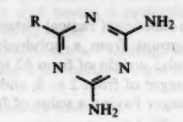
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807710

Int. Cl.[2] **C08J** *9/18, 9/20*

U.S. Cl. 521—56 **2 Claims**



1. Foamable particles of a styrene homo- or copolymer containing an expanding agent and a flameproofing organic halogen compound, which comprise in addition from 0.0001 to 0.1, preferably 0.001 to 0.05, % by weight, relative to the polymer, of a 2,4-diamino-1,3,5-triazine derivative of the formula



in which

R is an alkyl radical having from 1 to 20, preferably 4 to 15, carbon atoms, where optionally a H atom in ω-position is substituted by a 2,4-diamino-1,3,5-triazine-6-yl radical; or a cycloalkyl radical having from 5 to 12 carbon atoms, or a cycloalkyl-alkyl or alkyl-cycloalkyl radical having from 6 to 13 carbon atoms, or an aryl radical having from 5 to 12, preferably 6 to 12, carbon atoms; or an alkylaryl or aralkyl radical having from 6 to 13, preferably 7 to 13, carbon atoms.

4,192,923

AMINO RESIN FOAM, ONE-PHASE SOLUTION FOAM PRECURSOR AND METHOD OF PRODUCING FOAM

Edward G. Tajkowski, Williamsville, N.Y., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Oct. 27, 1978, Ser. No. 955,439

Int. Cl.[2] C08J *9/30*

U.S. Cl. 521—117 **14 Claims**

1. A one-phase solution capable of exothermic reaction to form an amino resin foam consisting essentially of:

(a) from about 2 to about 20% by methylene chloride by weight of resin solids;

(b) from about 10 to about 40% propylene glycol by weight of resin solids;

(c) from about 30 to about 56% formaldehyde by weight of resin solids;

(d) from about 35 to about 59% by weight urea by weight of resin solids;

(e) from 0 to about 14% melamine by weight of resin solids;

(f) from 0 to about 25% water by weight of composition; and

(g) an acidic catalyst which promotes the reaction of urea and formaldehyde and which is soluble in said solution in an amount sufficient to lower the pH of the solution to below about 3.

4,192,924

METHOD OF FOAMING CURABLE ORGANIC RESIN COMPOSITIONS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 962,997, Nov. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 861,127, Dec. 16, 1977. This application Apr. 30, 1979, Ser. No. 34,372

Int. Cl.[2] C08J *9/14*

U.S. Cl. 521—126 **3 Claims**

1. A foaming method which comprises

(1) agitating a curable composition comprising,

(E) a cationically polymerizable organic material,

(F) 1% to 35% by weight of the curable composition of a mixture of

(vii) a diaryliodonium salt of the formula,

$$[(R)_a(R^1)_bI]^+[Y]^-,$$

(viii) 0.5 part to 10 parts, per part of (vii), of a member selected from the class consisting of ascorbic acid, an ascorbic acid derivative, an Sn^{+2} salt and an activated α-hydroxy compound, and

(G) 1% to 30% by weight of (E), (F), & (G) of a volatile inert organic solvent and

(2) allowing the ingredients of the resulting mixture to react resinting in the production of exothermic heat and the simultaneous vaporization of the organic solvent and the cure of the cationically curable organic resin,

where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, Y is a non-nucleophilic anion, a is a whole number equal to 0 or 2, and b is a whole number equal to 0 or 1.

4,192,925

POLYHYDROXYL COMPOUNDS CONTAINING GUANIDINE GROUPS

Walter Schafer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 889,463, Mar. 23, 1978. This application Apr. 16, 1979, Ser. No. 30,491

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714292

Int. Cl.[2] C08G *18/06*

U.S. Cl. 521—163 **1 Claim**

1. A process for the preparation of optionally cellular polyurethane plastics comprising reacting:

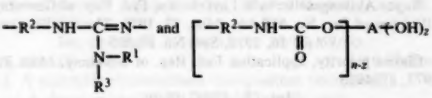
(a) polyisocyanates, with

(b) polyhydroxyl compounds; and, optionally,

(c) other compounds containing isocyanate-reactive groups; optionally in the presence of

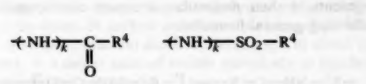
(d) blowing agents; catalysts and other known agents; wherein component (b) comprises compounds

containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 15,000, which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein

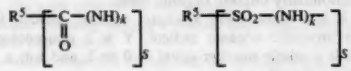
R^1 represents hydrogen or C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain one or two substituents selected from the group consisting of hydroxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane, trifluoromethyl or nitrile groups, fluorine, chlorine, bromine or iodine or R^1 represents one of the radicals:



or R^1 together with R^3 and the nitrogen atom forms a 5- or 6 membered heterocyclic ring optionally containing as additional hetero atoms an oxygen atom or up to two nitrogen atoms;

R^2 represents a divalent aliphatic, cycloaliphatic, aromatic or araliphatic radical containing from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;

R^3 represents a monovalent or—in the form of a bridge to other guanidine groups—divalent or trivalent C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain one or two substituents selected from the group of hydroxyl, alkoxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane, trifluoromethyl or nitrile groups, fluorine, chlorine, bromine or iodine; or one of the radicals:



or together with R^1, the nitrogen atom and, optionally, the nitrogen atom of another guanidine group forms a 5-or 6-membered heterocyclic ring optionally containing as an additional hetero atom an oxygen or nitrogen atom;

R^4 represents an aliphatic, cycloaliphatic, araliphatic or aromatic radical containing from 1 to 15 carbon atoms;

R^5 represents an s-valent aliphatic cycloaliphatic, araliphatic or aromatic radical containing from 1 to 15 carbon atoms;

A represents an n-valent radical of the type obtained by removing the hydroxyl groups from a polyhydroxyl compound having a molecular weight of from 62 to 6000;

n represents an integer of from 2 to 8

s represents an integer of from 1 to 3;

z represents an integer having a value of from 0 to (n−1); and

k represents 0 or 1.

4,192,926

POLYHYDROXYL COMPOUNDS CONTAINING ACYL UREA GROUPS

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 889,464, Mar. 23, 1978. This application Apr. 16, 1979, Ser. No. 30,495

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714923

Int. Cl.[2] C08G *18/06*

U.S. Cl. 521—163 **1 Claim**

1. A process for the preparation of optionally cellular polyurethane plastics comprising reacting:

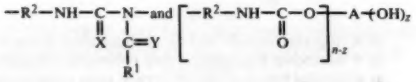
(a) polyisocyanates, with

(b) polyhydroxyl compounds; and, optionally,

(c) other compounds containing isocyanate-reactive groups; optionally in the presence of

(d) blowing agents, catalysts and other known agents;

wherein component (b) comprises compounds containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 20,000 which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein

X and Y, which may be the same or different, each represents oxygen or sulphur;

R^1 represents hydrogen or a monofunctional or—in the form of a bridge to further acyl groups—a di-or trifunctional C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic, C_6–C_{15} araliphatic or aromatic radical which may contain one or two double bonds and/or be branched and which may optionally contain one or two substituents selected from the group consisting of hydroxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane or trifluromethyl groups, fluorine, chlorine, bromine or iodine;

R^2 represents a difunctional aliphatic, cycloaliphatic, aromatic or araliphatic radical containing from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;

A represents an n-functional radical obtained by removing the hydroxyl groups from a polyhydroxyl compound having a molecular weight of from 62 to 6000;

n represents an integer of from 2 to 8; and

z represents an integer having a value of from 0 to (n−1).

4,192,927

POLYHYDROXYL COMPOUNDS CONTAINING PHOSPHONORMAMIDINE GROUPS

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 889,329, Mar. 23, 1978. This application Apr. 16, 1979, Ser. No. 30,494

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714289

Int. Cl.[2] C08G *18/06*

U.S. Cl. 521—165 **1 Claim**

1. A process for the preparation of optionally cellular polyurethane plastics comprising reacting:

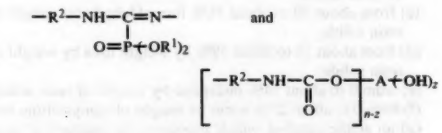
(a) polyisocyanates, with

(b) polyhydroxyl compounds; and, optionally,

(c) other compounds containing isocyanate-reactive groups; optionally in the presence of

(d) blowing agents, catalysts and other known agents;

wherein compounds (b) comprise compounds containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 15,000, which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein

R^1 represents a C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain a substituent selected from the group consisting of hydroxyl or trifluoromethyl groups, fluorine, chlorine, bromine or iodine;

R^2 represents a divalent aliphatic, cycloaliphatic, aromatic or araliphatic radical having from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;

A represents an n-valent radical of the type obtained by removing the hydroxyl groups from a polyhydroxyl compound having a molecular weight of from 62 to 6000;

n represents an integer of from 2 to 8; and

z represents an integer having a value of from 0 to (n−1).

4,192,928

THERMOPLASTIC POLYURETHANE AND PROCESS FOR THE PREPARATION THEREOF

Atsushi Tanaka, Iwakuni; Toshihiko Shinoda, and Masahisa Mimura, both of Mihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 861,088, Dec. 15, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,288

Claims priority, application Japan, Dec. 30, 1976, 51-159807; Mar. 23, 1977, 52-31122

Int. Cl.[2] C08G *18/14, 18/32, 18/65*

U.S. Cl. 521—177 **17 Claims**

1. A linear thermoplastic polyurethane useful for forming a

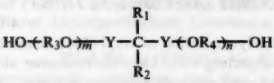
microporous artificial leather of moderate elasticity consisting essentially of the polymerization product of:

(A) a long-chain diol having a molecular weight of from about 800 to about 4,000;

(B) a difunctional active hydrogen-containing chain-extender having a molecular weight of from about 50 to about 150;

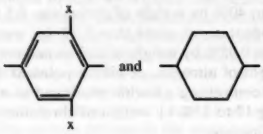
(C) an organic diisocyanate; and

(D) a diol compound represented by formula (I):

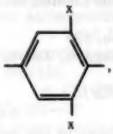


(I)

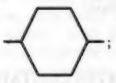
wherein R_1 and R_2, which may be the same or different, are hydrogen or an alkyl radical having from 1 to 3 carbon atoms, R_3 and R_4, which may be the same or different, are an alkylene radical having from 2 to 4 carbon atoms; Y is a bivalent radical selected from the group consisting of



wherein x is hydrogen, chlorine, bromine or a methyl radical; m and n are positive integers satisfying the formula $2 \leqq m+n \leqq 10$ when Y is



or m and n are zero or positive integers satisfying the formula $0 \leqq m+n \leqq 10$ when Y is



further wherein said component (D) comprises from about 5% to about 15% by weight of the polyurethane, and the nitrogen atoms derived from said component (C) comprise from about 3% to about 6% by weight of the polyurethane, wherein the thermoplastic polyurethane has a tensile stress at 5% elongation of from 0.1 to 0.5 kg/m^2, a tensile stress at 20% elongation of from 0.2 to 1.0 kg/m^2 and an elongation recovery at 50% elongation of from 50% to 87% at a temperature of 20° C., measured in the form of a polyurethane film.

4,192,929

CORROSION RESISTANT PRIMERS

Robert C. Wingfield, Jr., Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 31, 1978, Ser. No. 938,673

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 525—110 **9 Claims**

1. An electrodepositable primer composition which comprises an intimate admixture of film forming ingredients which consist essentially of:

(A) A substantially gel free epoxy and amine reaction product, at least partially neutralized, made by reacting in non-aqueous medium:

1. A non-carboxy ester linked epoxy reactant that has an average of at least about two epoxy groups per molecule;

2. An amine reactant selected from mono and diamines that contain a primary or secondary amino group and up to about 20 carbon atoms per amino nitrogen and comprising at least about 50 mole percent hydroxy amine containing one or more primary hydroxy groups,

in an equivalent amount such that the reaction product (A) comprises tertiary amino and primary and secondary hydroxy groups and is substantially free of unreacted epoxy groups;

(B) An amine aldehyde resin crosslinking agent at about 5–60% by weight of the weight of (A);

(C) About 0.1–5% by weight of (A) of a flow control agent having a number average molecular weight of about 1000–20,000 and comprising a reactive copolymer made from:

(1) 5–95 mole percent any of epoxy, carboxy and hydroxy functional acrylic monomers, and

(2) 95–5 mole percent of other monomers, a major molar proportion of which contain aliphatic carbon chains of about 3–18 carbons.

4,192,930

ESTERIFIED OLEFIN-MALEIC ANHYDRIDE COPOLYMERS

Heinz Beck, Duren; Karl H. Frassek, Langerwehe; Werner Holtvoigt, Lohne-Riessel, and Ambar Mukerjee, Nideggen, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 15, 1978, Ser. No. 915,859

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727329

Int. Cl.^{2} C08L *33/04, 33/20, 55/02, 69/00*

U.S. Cl. 525—227 **18 Claims**

1. A moldable thermoplastic composition comprising:

(a) A thermoplastic mold formable plastic, and

(b) A minor shaping processing improving amount of an esterified olefin-maleic anhydride copolymer comprising a copolymer of an olefin containing 2 to about 24 carbon atoms and maleic anhydride, esterified with a monoualent alcohol containing 2 to about 20 carbon atoms, in a molar ratio of maleic anhydride to alcohol of from about 1:0.5 to about 1:2.

13. In a method of shaping a thermoplastic mold formable polymer using heat and pressure the improvement comprising admixing the thermoplastic polymer with a minor shaping processing improving amount of an esterified olefin-maleic anhydride copolymer comprising a copolymer of an olefin containing 2 to about 24 carbon atoms and maleic anhydride, esterified with a monomualent alcohol containing 2 to about 20 carbon atoms, in a molar ratio of maleic anhydride to alcohol of from about 1:0.5 to about 1:2.

4,192,931

PROCESS FOR PRODUCING FURAN-EPOXY POWDER-LIKE BINDER

Gennady D. Varlamov, ulitsa Jubileinaya, 5 kv. 13; Juldash Mamatov, ulitsa Pushkina 50, kv. 60; Ildgam A. Bekbulatov, Kashkarskaya ulitsa 215, and Shavkat Madaliev, ulitsa Yarmazar 361, all of Fergana, U.S.S.R.

Filed Aug. 7, 1978, Ser. No. 931,313

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 525—489 **2 Claims**

2. A process for producing a furan-epoxy powder-like binder comprising reaction (A) 100 parts by weight of an epoxy diane resin with (B) 40–500 parts by weight of a ketone of the furan series selected from the group consisting of monofurfurylideneacetone, difurfurylideneacetone, difurfurylidenecyclohexanone, a mixture of monofurfurylideneacetone and difurfurylideneacetone at a ratio therebetween, ex-

pressed in parts by weight, of from 1:1 to 1.4:1; 1,9-di-(α-furyl)-nonanetetraene-1,3,6,8-one-5 or 1,5-di-(αfuryl)-2,4-dimethylpentadiene-1,4-one-3; and (C) 60–500 parts by weight of a modifying agent selected from the group consisting of phenol-formaldehyde resin and anhydrides of dibasic carboxylic acids; at a temperature within the range of from 130° to 180° C. and in the presence of 10–30 parts by weight of trifurylborate; cooling the resulting product to a temperature of at most 30° C.; and disintegrating the cooled product to a powder-like condition.

4,192,932

ALKALINE RESISTANT ORGANIC COATINGS FOR CORROSION SUSCEPTIBLE SUBSTRATES IV

Ray A. Dickie, Birmingham; Joseph W. Holubka, and Mohinder S. Chattha, both of Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 31, 1978, Ser. No. 938,672

Int. Cl.[2] C08L *63/00*

U.S. Cl. 525—511 **16 Claims**

1. In a crosslinking composition, especially suitable for use in primer compositions that retard corrosion of susceptible substrates and do not require chromate inhibiting pigments and which comprises an intimate mixture of film forming ingredients which consist essentially of:

(A) A substantially gel free epoxy and amine reaction product, optionally at least partially neutralized, made by reacting in non-aqueous medium:

1. A non-carboxy-ester linked epoxy reactant that has an average of at least about two epoxy groups per molecule;

2. An amine reactant selected from the group consisting of secondary amines and primary and secondary amines having a total of up to about 20 carbons per amino nitrogen and comprising at least about 75 mole percent hydroxy amine containing one or more primary hydroxy groups removed at least one carbon from any amino nitrogen,

in an equivalent amount such that the reaction product (A) comprises tertiary amino and primary and secondary hydroxy groups and is substantially free of unreacted epoxy groups;

(B) Optionally, a di- or polyhydroxy compound;

(C) An amine-aldehyde resin crosslinking agent at about 5–35% by weight of the combined weight of (A) and (B), the improvement which comprises

(D) About 0.1–5% by weight of the combined weight of (A) and (B) of one or more hydroxy organophosphate esters corresponding to the formula:

$$(R{-}O)_n\overset{\overset{O}{\|}}{P}(OH)_{3-n}$$

wherein n is 1 to 2 and R is independently mono- or dihydroxy substituted hydrocarbon having up to about 10 carbons.

4,192,933

NON-PULVERULENT SOLID POLYMERIC STRUCTURE

Leonard E. Edelman, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 727,481, Sep. 28, 1976, abandoned. This application May 31, 1978, Ser. No. 911,253

Int. Cl.[2] C08F *8/30, 8/32*

U.S. Cl. 525—377 **9 Claims**

1. A method of making a non-pulverulent solid polymeric structure, of acrylonitrile or a copolymer thereof, which has at least one pendant diaminotriazine ring comprising immersing a non-pulverulent solid polymeric structure of acryllonitrile or a copolymer thereof which has at least one pendant nitrile group into a basic organic solution of cyanoguanidine at a pH of about 8 to about 10 without permitting said polymeric structure to dissolve therein.

4,192,934

EQUIPMENT FOR POLYMERIZATION OF VINYL CHLORIDE MONOMERS AND POLYMERIZATION PROCESS USING THE SAME

Tsukasa Takahashi; Takeshi Sekihara; Tomoyuki Emura, and Masayoshi Miki, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 28, 1978, Ser. No. 928,970

Claims priority, application Japan, Aug. 9, 1977, 52-95869; Sep. 22, 1977, 52-11439

Int. Cl.[2] B01J *8/00;* C08F *2/16, 14/06*

U.S. Cl. 526—62 **4 Claims**

4. A process for polymerization of vinyl chloride monomers which comprises subjecting vinyl chloride monomer alone or mixtures comprising vinyl chloride monomer as a main component and a monomer copolymerizable therewith to radical polymerization in the presence of a radical-generating catalyst in an aqueous medium using equipments for polymerization of vinyl chloride monomers in which the inside wall of the polymerization vessel and/or the surface of attachments to the vessel which are brought into contact with said monomers are wholly or partially made of mirror-polished ferritic stainless steel containing 15 to 40% by weight of chromium, 0.5 to 5% by weight of molybdenum, not more than 0.5% by weight of nickel, not more than 0.05% by weight of carbon and not more than 0.05% by weight of nitrogen, or mirror-polished duplex phase stainless steel comprising a ferritic phase and an austenitic phase containing 17 to 35% by weight of chromium and 2 to 8% by weight of nickel.

4,192,935

ETHYLENE POLYMERS OF HIGH MELT INDEX

Peter J. Lovell, Kingston, and Ian C. B. Saunders, Sarnia, both of Canada, assignors to DuPont of Canada Limited, Montreal, Canada

Filed Jan. 2, 1979, Ser. No. 170

Claims priority, application United Kingdom, Jan. 6, 1978, 00517/78

Int. Cl.[2] C08F *210/02, 210/16*

U.S. Cl. 526—348.6 **5 Claims**

1. An ethylene polymer having a density in the range of about 0.940–0.960, a melt index in the range 100–200 and a ratio of weight-average molecular weight to number-average molecular weight of less than 5, said polymer being a copolymer of ethylene and at least one α-olefin having 4–10 carbon atoms, the α-olefin being an aliphatic hydrocarbon.

4,192,936

PREPARATION OF POLYISOCYANATES CONTAINING BIURET GROUPS

Edgar Mohring, Bergisch-Gladbach; Kuno Wagner, and Hanns P. Muller, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 850,888, Nov. 14, 1977, Pat. No. 4,152,350. This application Feb. 2, 1979, Ser. No. 8,727

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654745

Int. Cl.[2] C08G *18/78, 18/14*

U.S. Cl. 528—59 **2 Claims**

1. In the isocyanate polyaddition process for the production of polyurethane resins, the improvement comprising reacting polyhydroxyl compounds with polyisocyanate mixtures containing biuret groups prepared by the reaction of excess quantities of organic polyisocyanates with compounds which react with isocyanate groups to form biuret groups, characterized in that the organic polyisocyanates are reacted with a mixture which contains:

(A) at least one monohydric primary or secondary aliphatic or cycloaliphatic alcohol;

(B) at least one monoamine or polyamine having at least one

aliphatically, cycloaliphatically or araliphatically bound primary amino group; and, optionally,

(C) water or a compound which splits off water.

4,192,937

PROCESS FOR THE PREPARATION OF ISOCYANATE POLYADDITION PRODUCTS WHICH HAVE HYDROXYL GROUPS IN SIDE CHAINS

Klaus Noll, Cologne; Klaus Nachtkamp, Bergisch-Gladbach, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,285

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732131

Int. Cl.[2] C08G *18/10, 18/38;* C08L *75/12*

U.S. Cl. 528—59 **10 Claims**

1. A process for the preparation of substantially linear isocyanate polyaddition products containing hydroxyl groups derived from oxazolidine groups in sidechains by the reaction of reactive systems which contain free isocyanate groups and oxazolidine groups with water, characterized in that

(a) substantially linear prepolymers which have both isocyanate end groups and oxazolidine end groups or

(b) a mixture containing substantially linear isocyanate prepolymers and bis-oxazolidines are chain lengthened by mixing with water, using a quantity of water calculated to provide at least about 1 mol of water per mol of oxazolidine groups present in the reaction mixture.

4,192,938

MODIFIED POLYISOCYANATES CONTAINING SULFONIC ACID ESTER GROUPS

Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,815

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801130

Int. Cl.[2] C08G *18/77, 18/14;* C07C *143/68*

U.S. Cl. 528—67 **12 Claims**

1. A process for the preparation of modified polyisocyanates which contain sulfonic acid alkyl ester groups and in which the isocyanate groups may be at least partly in the dimerized form, comprising: racting isocyanatoaryl sulfonic acids having at least two isocyanate groups and wherein the isocyanate groups may be at least partly in the dimerized form, optionally as mixtures with mono and/or polyisocyanates which are free from sulfonic acid groups with lactones at 0° to 190° C., wherein at least one of said lactones is a 6 to 9 membered ring lactone and the equivalent ratio of isocyanate groups, including any isocyanate groups present in the dimerized form, to sulfonic acid groups is greater than 1 and the equivalent ratio of lactone groups to sulfonic acid groups is from 0.1:1 to 10:1.

11. Polyisocyanate mixtures, comprising:

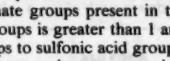
(a) 4 to 48% by weight of isocyanate groups optionally present partly in the dimerized form,

(b) 0.3 to 38% by weight of groups of the formula $-SO_2-O-$ forming part of an aryl sulfonic acid alkyl ester group,

(c) 0 to 36% by weight of $-SO_3H$ groups,

(d) 0 to 25% by weight of amide groups —NH—CO— and

(e) 0 to 28% by weight of acyl urea groups



the groups mentioned under (d) and (e) together amounting to at least 0.4% by weight and no more than 28% by weight and the groups mentioned under (b) and (c) together amounting to not more than 38% by weight.

12. In a process for the production of urethane groups containing products comprising reacting an isocyanate with an isocyanate reactive group containing compound, the improvement wherein the isocyanate is a polyisocyanate mixture comprising:

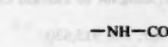
(a) 4 to 48% by weight of isocyanate groups optionally present partly in the dimerized form,

(b) 0.3 to 38% by weight of groups of the formula $-SO_2-O-$ forming part of an aryl sulfonic acid alkyl ester group,

(c) 0 to 36% by weight of $-SO_3H$ groups,

(d) 0 to 25% by weight of amide groups —NH—CO— and

(e) 0 to 28% by weight of acyl urea groups



the groups mentioned under (d) and (e) together amounting to at least 0.4% by weight and no more than 28% by weight and the groups mentioned under (b) and (c) together amounting to not more than 38% by weight.

4,192,939

PHOSPHONIUM CATALYST SYSTEM FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 724,802, Sep. 20, 1976, Pat. No. 4,100,146. This application May 8, 1978, Ser. No. 903,419

Int. Cl.[2] C08G *69/20*

U.S. Cl. 528—313 **2 Claims**

1. The process of polymerizing a 2-pyrrolidone composition by contacting an alkali metal pyrrolidonate, a tetraalkyl phosphonium halide and carbon dioxide in a mol ratio 1:0.1–2:0.1–0.5, respectively, and additionally 0.01–0.5 mol percent of N-acyl pyrrolidone or N-acylcaprolactam or acetic anhydride, with 2-pyrrolidone monomer to yield a poly- 2-pyrrolidone polymer capable of being formed into filaments, films, or shaped articles.

4,192,940

POLYESTERS WHICH CAN BE PREPARED BY REACTING A CARBONIC ACID ARYL ESTER WITH A POLYESTER PREPARED FROM A POLYHYDRIC ALCOHOL AND A POLYBASIC CARBOXYLIC ACID WHICH IS ALIPHATIC

Christian Lindner, Cologne; Carlhans Suling; Herbert Bartl, both of Odenthal, and Dietrich Hardt, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

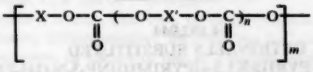
Filed Jul. 14, 1978, Ser. No. 924,708

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732718

Int. Cl.[2] C08L *67/02*

U.S. Cl. 528—370 **7 Claims**

1. A polyester containing carbonate groups and consisting of repeating structural units corresponding to the general formula (I):



(I)

in which

X is the residue of a hydroxy terminated reaction product of at least one polyhydric alcohol with a polybasic, aliphatic carboxylic acid having a molecular weight of from 800 to 3500 or with an anhydride or ester of the acid, or a mixture thereof

X' has the same meaning as X or X' is the residue of an

hydroxy terminated aliphatic polyether having a molecular weight of from 800 to 3500,

n=0 or 1 to 10 and

m is a number >20,

having an intrinsic viscosity in tetrahydrofuran of from 0.8 to 2.5 (dl/g).

4,192,941

CURED POLYSULFIDE POLYMERS SUITABLE FOR HOT MELT APPLICATIONS

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Jun. 8, 1978, Ser. No. 913,630

Int. Cl.[2] C08G *75/04*

U.S. Cl. 528—374 **2 Claims**

1. A process for the preparation of a cured polysulfide rubber based on a thiol terminated liquid polysulfide polymer, said cured rubber being capable of extrusion under heat and pressure with recovery of substantially its original physical properties, which comprises:

(a) blending a thiol terminated liquid polysulfide polymer, zinc oxide and substantially anhydrous acetic acid; and

(b) allowing the blend prepared in step (a) to cure to a solid.

4,192,942

EMULSIFIABLE ETHYLENE/CARBON MONOXIDE COPOLYMER WAXES

Kenneth R. Mainord, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,121

Int. Cl.[2] C08F *10/02*

U.S. Cl. 260—597 R **20 Claims**

1. A process for the production of emulsifiable ethylene/carbon monoxide copolymer wax which comprises oxidizing an ethylene/carbon monoxide copolymer having a melt index of about 0.1 to about 500 and a density of about 0.92 to about 0.98 in the solid phase at a temperature of about 75° C. to about 95° C. until said emulsifiable copolymer wax has an acid number of at least 10.

4,192,943

METHOD FOR REDUCING OLIGOMERIC CYCLIC ETHER CONTENT OF A POLYMERIZATE

Ivan M. Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 915,190, Jun. 13, 1978, abandoned. This application Dec. 21, 1978, Ser. No. 970,733

Int. Cl.[2] C08G *65/30*

U.S. Cl. 528—417 **6 Claims**

1. A method for reducing the oligomeric cyclic ether content of a substantially monomer-free THF/alkylene oxide polymerizate, the method comprising bringing the polymerizate into contact, at a temperature of 70°–150° C., with 1–50%, by weight of the polymerizate, of an acid-activated sodium or calcium montmorillonite clay, for a time sufficient to significantly reduce the oligomeric cyclic ether content of the polymerizate.

4,192,944

OPTIONALLY SUBSTITUTED 4-OXO-4H-PYRIDO[1,2-a]PYRIMIDINE-3-N-(1H-TETRAZOL-4-YL)CARBOXAMIDES AND THEIR USE AS ANTIALLERGY AGENTS

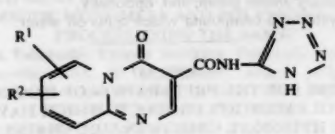
Peter F. Juby, Jamesville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,714

Int. Cl.[2] C07D *403/12*; A61K *31/505*

U.S. Cl. 544—282 **27 Claims**

1. A compound of the formula



wherein R^1 and R^2 which may be the same or different are each hydrogen, halogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, (lower)alkoxy, CF_3, hydroxy, (lower)alkylthio, amino, nitro, (lower)alkylamino, di(lower)alkylamino, carboxyl, phenyl, or (lower)alkylsulfinyl, or a pharmaceutically acceptable salt thereof, with the proviso that when R^1 and R^2 are tertiary alkyl or tertiary alkoxy groups, they are located on non-adjacent positions.

4,192,945

PROCESS FOR PREPARING PROLINE AND HOMOPROLINE DERIVATIVES

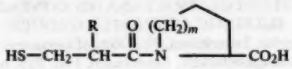
Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 967,335, Dec. 7, 1978. This application Mar. 15, 1979, Ser. No. 20,580

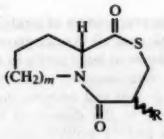
Int. Cl.[2] C07D *207/16, 211/60*

U.S. Cl. 546—245 **6 Claims**

1. A process for preparing a compound having the formula



which comprises hydrolyzing the corresponding compound having the formula



wherein R is hydrogen or alkyl of 1 to 7 carbon atoms and m is 1 or 2.

3. A process in accordance with claim 1 wherein m is 2.

4,192,946

PROCESS FOR PRODUCING 3-HYDROXY-5-HALOPYRIDINES

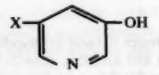
Niels Clauson-Kaas, Farum, Denmark; Gunter Mattern, Liestal, and Walter Traber, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,425

Int. Cl.[2] C07D *213/02*

U.S. Cl. 546—249 **9 Claims**

1. Process for producing 3-hydroxy-5-halopyridines of the formula



(I)

wherein

X represents chlorine or bromine,

which process comprises reacting 2-furfurylamine in aqueous

mineral-acid solution at −20° to +5° C. with 1.90 to 2.25 mols of halogen per mole of 2-furfurylamine, neutralising the hydrohalic acid formed, heating the reaction mixture at reflux temperature, cooling it, and isolating the formed 3-hydroxy-5-halopyridine of the formula I.

4,192,947

PROCESS FOR THE PRODUCTION OF AMINOPHENYLAMINOBENZIMIDAZOLES

Wolfgang Bauer, Maintal, and Joachim Ribka, Offenbach (Main)-Bürgel, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

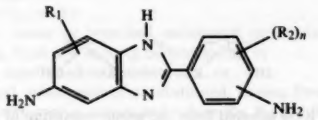
Filed Sep. 12, 1978, Ser. No. 941,462

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742093

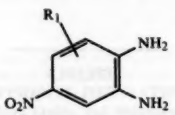
Int. Cl.[2] **C07D** *235/18*

U.S. Cl. 548—334 **9 Claims**

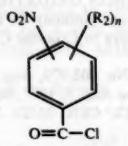
1. In the process for the production of compounds of the formula



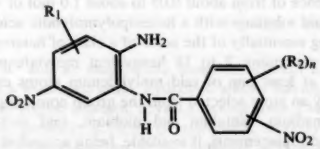
wherein R_1 and R_2 are the same or different and each is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chlorine or bromine, and n is 1 or 2, comprising reacting a compound of the formula



with a compound of the formula



to form the anilide of the formula



and cyclizing and reducing said anilide wherein the improvement comprises cyclizing the anilide in an aqueous alkaline medium and reducing the nitro moieties with a sulfide reductant.

4,192,948

TRANS-2,3-DIDEHYDRO-9-DEOXY-9-METHYLENE-ω-ARYL-PGF COMPOUNDS

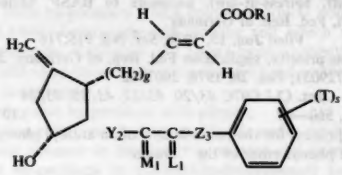
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 893,771, Apr. 5, 1978, Pat. No. 5,165,436. This application Aug. 11, 1978, Ser. No. 932,999

Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—55 **17 Claims**

1. A prostaglandin analog of the formula



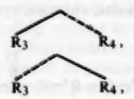
wherein Y_2 is trans—CH=CH—, $—CH_2CH_2—$, or cis—CH=CH—;

wherein M_1 is

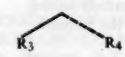
or

wherein R_5 is hydrogen or methyl;

wherein L_1 is



or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein g is 4, 5, or 6,

wherein Z_3 is oxa or $—(CH_2)_h—$,

wherein h is zero, one, two, or three; wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl

substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,192,949

PREPARATION OF ARALKYL PHENYL ETHERS AND ALKYL PHENYL ETHERS

Franz Merger, Frankenthal; Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, and Ludwig Schroff, deceased, late of Ludwigshafen, Fed. Rep. of Germany (by Meinie T. Schroff, heiress-at-law), assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

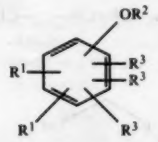
Filed Jun. 15, 1978, Ser. No. 915,716

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2729031; Feb. 28, 1978, 2807762

Int. Cl.[2] C07C *43/20, 43/22, 43/25, 43/24*

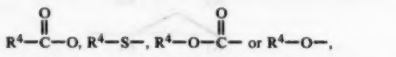
U.S. Cl. 560—67 **10 Claims**

1. A process for the manufacture of an aralkyl phenyl ether or alkyl phenyl ether of the formula



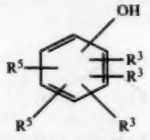
I

where the radicals R^1 are identical or different and each is hydrogen, hydroxyl or $—OR^2$, or the two radicals R^1 together with two mutually adjoining carbon atoms of the benzene ring are a fused phenylene radical, the radicals R^2 are identical or different and each is aralkyl of 7 to 12 carbon atoms or alkyl of 1 to 7 carbon atoms, the radicals R^3 are identical or different and each is phenyl or aralkyl of 7 to 12 carbons or alkyl of 1 to 12 carbon atoms or alkenyl of 2 to 12 carbon atoms, or alkyl of 1 to 12 carbon atoms, substituted by 2 oxo groups or one oxo group, hydrogen, bromine, chlorine, cyano, nitro,



where R^4 is alkyl of 1 to 12 carbon atoms or is phenyl, whereby the above radicals may in addition be substituted by alkyl or alkoxy each of 1 to 4 carbon atoms,

wherein a phenol of the formula



II

where R^3 has the above meanings and R^5 has the meanings of R^1 or, if R^1 is $—OR^2$, may also be hydroxyl, is reacted with a diaralkyl carbonate or a dialkyl carbonate of the formula

III

where the radicals R^2 are identical or different and have the above meanings, in the presence of a tertiary amine or of a tertiary phosphine or of both at from above 100° C. to 350° C.

4,192,950

15-DEOXY-16-HYDROXY-16-SUBSTITUTED PROSTANOIC ACIDS AND CONGENERS

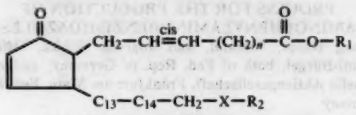
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Garnerville, N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 706,343, Jul. 14, 1976, Pat. No. 4,061,670. This application Sep. 22, 1977, Ser. No. 835,614

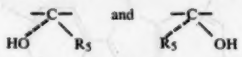
Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—500 **17 Claims**

1. An optically active compound of the formula:



or a racemic mixture of that formula and the mirror image thereof and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; R_2 is selected from the group consisting of alkyl having from 3 to 7 carbon atoms; X is a divalent moiety selected from the group consisting of those of the formulae:



wherein R_5 is selected from the group consisting of vinyl and cyclopropyl; n is an integer from 3 to 5 inclusive; the moiety $—C_{13}—C_{14}—$ is trans-vinylene or ethylene; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,192,951

HYDROCARBON OXIDATION PROCESS

William E. Slinkard, and Anthony B. Baylis, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 603,979, Aug. 11, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,663

Int. Cl.[2] C07C *51/20, 57/14*

U.S. Cl. 562—549 **13 Claims**

1. The process for producing maleic acid and acetic acid which comprises contacting n-butane and molecular oxygen in the vapor phase at about 180° C. to about 350° C., optionally in the presence of from about 0.05 to about 1.0 mol of water per mol of said n-butane with a heteropolymolybdic acid catalyst consisting essentially of the acids of a class of heteropolyelectrolytes containing 2 to 18 hexavalent molybdenum atoms wherein at least one of said molybdenum atoms can be replaced by an atom selected from the group consisting of tungsten, vanadium, tantalum and niobium, said molybdenum atoms and replacements, if available, being around at least one central heteroatom selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, niobium, platinum, cerium, thorium and the first row transition elements from titanium to zinc.

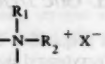
4,192,952

CUMENE OXIDATION USING 'ONIUM CATALYSTS

Kenneth C. Stueben, Bridgewater, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,694
Int. Cl.[2] C07C *179/04*
U.S. Cl. 568—574 6 Claims

1. A process for the production of cumene hydroperoxide which comprises the oxidation at from about 85° C. to about 135° C. of cumene in contact with oxygen and from 1 ppm to 900 ppm based on the total weight of the reaction mixture of a substituted ammonium halide catalyst of the general formula:



where X is a halide and where R_1, R_2 and R_3 taken singly can be:

(a) alkyl, linear or branched, substituted or unsubstituted, having from one to forty carbon atoms; or

(b) aryl, substituted or unsubstituted; or

(c) aralkyl, substituted or unsubstituted, having from seven to twenty carbon atoms; or

(d) hydrogen;

and where R_4 can be:

(a) alkyl, linear or branched, substituted or unsubstituted, having from one to forty carbon atoms: or

(b) aryl, substituted or unsubstituted; or

(c) aralkyl, substituted or unsubstituted, having from seven to twenty carbon atoms; and where R_2, R_3 and R_4 taken together with the nitrogen atom can form a heterocyclic ring containing from four to eight ring carbon atoms.

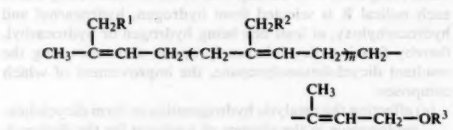
4,192,953

POLYPRENYL DERIVATIVES

Hiroshi Mishima; Akira Ogiso, and Shinsaku Kobayashi, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 807,913, Jun. 20, 1977, abandoned, which is a division of Ser. No. 633,097, Nov. 18, 1975, Pat. No. 4,059,641. This application Jan. 4, 1979, Ser. No. 1,162
Int. Cl.[2] C07C *43/00, 43/02*; A61K *31/08, 31/07*
U.S. Cl. 568—673 6 Claims

1. A compound having the formula



in which R^1 and R^2 may be the same or different and each represents a hydrogen atom, hydroxyl, alkoxy having from 1 to 8 carbon atoms, aliphatic acyloxy having from 2 to 18 carbon atoms, aromatic acyloxy or araliphatic acyloxy having from 2 to 3 carbon atoms in the aliphatic acyl moiety, R^3 represents alkyl having from 1 to 8 carbon atoms, n is an integer of from 1 to 4 and, when n is an integer of from 2 to 4, the R^2's may be the same or different; provided that, when n is 1 or 2, at least one of R^1 and R^2 is hydroxyl, alkoxy, aliphatic acyloxy, aromatic acyloxy or araliphatic acyloxy.

4,192,954

PROCESS FOR PREPARING 2,2-BIS(4-HYDROXY-PHENYL) PROPANE FROM DISTILLATION BY-PRODUCTS THEREOF

Henry P. Barker, Lock Haven, Pa., and Lawrence C. Mitchell, Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,666
Int. Cl.[2] C07C *37/44, 37/24*
U.S. Cl. 568—723 5 Claims

1. A process for the production of 2,2-bis(4-hydroxyphenyl) propane from by-products which contain products isomerizable to 2,2-bis(4-hydroxyphenyl) propane and which remain after purification distillation of 2,2-bis(4-hydroxyphenyl) propane produced by the condensation of phenol and acetone, said process comprising:

(i) mixing said by-products with phenol;

(ii) adding anhydrous hydrogen chloride under superatmospheric pressure to the resulting mixture and isomerizing said by-products to 2,2-bis(4-hydroxyphenyl) propane; and

(iii) subsequently recovering said 2,2-bis(4-hydroxyphenyl) propane.

4,192,955

PROCESS FOR THE RECOVERY OF 2,2-BIS(4-HYDROXYPHENYL) PROPANE

Clayton W. Reinitz, Mt Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 18, 1977, Ser. No. 865,297
Int. Cl.[2] C07C *37/44, 37/24*
U.S. Cl. 568—724 11 Claims

1. A process to recover 2,2-bis(4-hydroxyphenyl) propane from an equimolar adduct of 2,2-bis(4-hydroxyphenyl) propane and phenol, the process comprising dissolving the adduct in a solvent in which the adduct is soluble and which is miscible with water, mixing the resulting adduct-solvent solution with water at a temperature at which the adduct is soluble therein, cooling the resulting mixture to a temperature where substantially all of the 2,2-bis(4-hydroxyphenyl) propane precipitates substantially without co-precipitation of the phenol and physically recovering said precipitated 2,2-bis(4-hydroxyphenyl) propane.

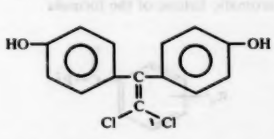
4,192,956

DEHYDROHALOGENATION OF A DIPHENYL TRICHLOROETHANE

Michael R. MacLaury, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,103
Int. Cl.[2] C07C *37/00*
U.S. Cl. 568—726 8 Claims

1. In the process for dehydrohalogenating the trichloride, 1,1,1-trichloro-2,2-bis(4-hydroxyphenyl) ethane, to form the dichloride of the formula



by treating the aforesaid trichloride with anhydrous liquid ammonia in an amount sufficient to act as both a dehydrohalogenating agent and solvent, the improvement which comprises adding to the liquid ammonia an amount of an inorganic halide effective to accelerate the dehydrohalogenation reaction of the ammonia, wherein said inorganic halide is selected from the class consisting of ammonium chloride and

bromide, lithium chloride and bromide, and sodium chloride and bromide.

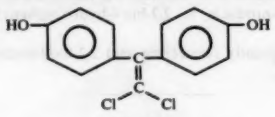
4,192,957

DEHYDROHALOGENATION OF A DIPHENYL TRICHLOROETHANE

Michael R. MacLaury, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,104
Int. Cl.² C07C *37/00*
U.S. Cl. 568—726 **7 Claims**

1. In a process for dehydrohalogenating the trichloride, 1,1,1-trichloro-2,2-bis-(4-hydroxyphenyl) ethane, to form the dichloride of the formula



which process comprises (1) treating the aforesaid trichloride with anhydrous liquid ammonia in an amount sufficient to act as both a dehydrohalogenating agent and solvent, the improvement comprising the said liquid ammonia containing an amount of an alkyl amine effective to accelerate the dehydrohalogenation reaction, wherein said alkyl amine is selected from the class consisting of methylamine hydrochloride and bromide, ethylamine hydrochloride and bromide, and dimethylamine hydrochloride and bromide, thereby to form a substantially pure dichloroethylene compound of the above formula, and (2) removing the unreacted ammonia and alkyl amine thereby isolating the desired dichloride.

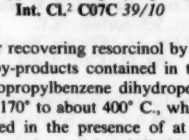
4,192,958

METHOD FOR RECOVERING RESORCINOL

Isao Hashimoto, Waki; Hiroaki Nakagawa, Iwakuni, and Hirohiko Nambu, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 945,883
Claims priority, application Japan, Sep. 30, 1977, 52/116887
Int. Cl.² C07C *39/10*
U.S. Cl. 568—763 **4 Claims**

1. A method for recovering resorcinol by thermally cracking high-boiling by-products contained in the acid-cleavage product of m-diisopropylbenzene dihydroperoxide at a temperature of about 170° to about 400° C., wherein the thermal cracking is effected in the presence of at least 7 parts by weight, per 100 parts by weight of the high-boiling by-products, of an aromatic ketone of the formula



wherein R^1 represents a member selected from the group consisting of hydrogen, saturated alkyl groups having 1 to 6 carbon atoms, hydroxyl, acetyl and chlorine, R^2 represents a member selected from the group consisting of saturated alkyl groups having 1 to 6 carbon atoms, cyclohexyl and phenyl, and n represents 1, 2 or 3, and when there are two or more R^1 groups, they are identical or different.

4,192,959

PROCESS FOR THE PREPARATION OF PURE 2-HYDROXYBENZYL ALCOHOL, PURE 4-HYDROXYBENZYL ALCOHOL OR A MIXTURE OF BOTH HYDROXY-BENZYL ALCOHOLS

Kurt Bauer; Alfred Krempel, both of Holzminden; Reiner Möleken, Goimbach-Warbsen; Karlfried Wedemeyer, Cologne, and Helmut Fiege, Leverkusen, all of Fed. Rep. of Germany, assignors to Haarmann & Reimer, Leverkusen, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,489
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2729075
Int. Cl.² C07C *37/26, 39/16*
U.S. Cl. 568—764 **15 Claims**

1. A process for the preparation of pure 2-hydroxybenzyl alcohol and pure 4-hydroxybenzyl alcohol or a mixture of both compounds, which comprises reacting phenol with formaldehyde in the presence of about 0.05 to 0.0001 mol of a basic catalyst per mol of phenol at about 25° to 120° C. for about 0.5 to 5 hours to form a reaction mixture containing unreacted phenol, 2-hydroxybenzyl alcohol, 4-hydroxybenzyl alcohol, dihydroxydiphenylmethanes and polyhydroxymethylphenols, subjecting the resulting reaction mixture to countercurrent extraction in a solvent system of water/organic solvent, the organic solvent comprising an alkylaromatic compound with 7 or 8 C atoms, a cycloaliphatic hydrocarbon with 6 to 8 C atoms or an aliphatic ether with 6 to 8 C atoms, the system containing sufficient water to form an aqueous phase containing the 2- and 4-hydroxybenzyl alcohols and an organic phase comprising phenol and the dihydroxydiphenylmethanes, separating the organic phase, and in a second stage subjecting the aqueous phase to countercurrent extraction with an organic solvent to form an organic phase containing at least the 2-hydroxybenzyl alcohol and an aqueous phase containing the polyhydroxymethylphenols.

4,192,960

PROCESS FOR MANUFACTURING DICYCLOHEXANOL PROPANE BY HYDROGENATION OF DIPHENOL PROPANE

Gérard Hillion, Herblay, and Christian Lassau, Villepreux, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Mar. 10, 1978, Ser. No. 885,223
Claims priority, application France, Mar. 10, 1977, 77 07444
Int. Cl.² C07C *35/21*
U.S. Cl. 568—816 **16 Claims**

1. In a process for producing a dicyclohexanolpropane by hydrogenation of diphenolpropane, which comprises the steps of contacting diphenolpropane with molecular hydrogen in the presence of a homogeneous hydrogenation catalyst consisting essentially of the reaction product of at least one transition metal compound with a compound of the formula AlR_3, where each radical R is selected from hydrogen, hydrocarbyl and hydrocarbyloxy, at least one being hydrogen or hydrocarbyl, thereby forming dicyclohexanolpropane; and recovering the resultant dicyclohexanolpropane, the improvement of which comprises:

(a) effecting the catalytic hydrogenation to form dicyclohexanolpropane in the absence of a solvent for the diphenolpropane until at least 80% of the theoretical amount of hydrogen has been absorbed; and only then

(b) adding at least 0.05 part by weight of an alcohol having 1–12 carbon atoms and at least 0.005 part by weight of water for each part by weight of starting diphenolpropane, thereby forming (1) a solution of the alcohol and dicyclohexanolpropane and (2) an insoluble catalyst phase; wherein the amount of water added is sufficient to effect the formation of an insoluble catalyst phase but insufficient to cause separation of the alcohol from the solution of alcohol and dicyclohexanolpropane;

(c) separating the catalyst phase from the solution of alcohol and dicyclohexanolpropane; and

(d) recovering dicyclohexanolpropane from the separated solution of the alcohol and dicyclohexanolpropane.

4,192,961

METHOD AND CATALYST FOR PREPARING STYRENE

Sergei A. Polyakov, 3 Sovetskaya ulitsa, 16, kv. 9; Aron L. Shapiro, ulitsa Lensoveta, 50, kv. 29, and Viktor J. Gankin, ulitsa Khalturina, 20, kv. 6, all of Leningrad, U.S.S.R.

Filed Oct. 4, 1977, Ser. No. 839,348

Int. Cl.[2] **C07C** *15/00*

U.S. Cl. 585—319 **1 Claim**

1. A method for preparing styrene which comprises dehydrodimerization of toluene with a subsequent catalytic conversion of the resulting dehydrodimerization products to styrene at a temperature ranging from 300° to 600° C. in the presence of ethylene using a catalyst consisting of the following components, percent by weight:

chromium oxide	1.5 to 5.2
tungsten oxide	4.0 to 6.1
an oxide of an alkali metal	0.1 to 0.7

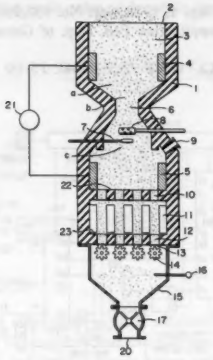
a carrier selected from the group consisting of silica and alumosilicate the balance.

4,192,962

METHOD AND APPARATUS FOR REGENERATING USED ACTIVATED CARBON

Kozaburo Nakao, Tokyo, and Toru Miyajima, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,752
Int. Cl.[2] F27B *1/08*; E27D *11/04*
U.S. Cl. 13—7 **2 Claims**



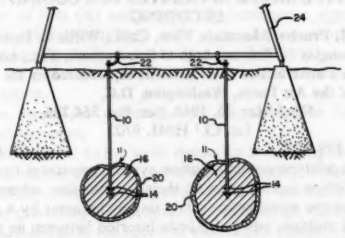
1. Apparatus for regenerating used activated carbon comprising a vertical electric furnace provided with an upper opening for charging used activated carbon to be generated, a bottom opening for discharging regenerated activated carbon, upper and lower generally annular electrodes mounted on the inner wall of said electric furnace said electrodes being spaced apart in the vertical direction, a horizontal plate located below said lower electrode and provided with slots for passing regenerated activated carbon, cooling tubes located beneath said slots and on the opposite sides of said slots for defining passages for regenerated activated carbon, and rotary discharge means located below said passages respectively, the inner cross-sectional area of said furnace gradually decreasing and then gradually increasing between said upper and lower electrodes thus forming a passage of said activated carbon, and a source of electric power for applying operating voltage across said electrodes.

4,192,963

GROUNDING ELECTRODE AND METHOD OF REDUCING THE ELECTRICAL RESISTANCE OF SOILS

Paul L. Koehmstedt, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Jan. 2, 1979, Ser. No. 488
Int. Cl.[2] H01R *3/06*
U.S. Cl. 174—6 **18 Claims**



1. A soil treating method comprising:

enhancing the electrical conductivity of a volume of soil in contact with additional soil; and

enclosing the volume of soil with a water repellant electrically conductive shell bonded to the additional soil.

3. A method of forming an underground grounding electrode comprising:

injecting a first solution into a volume of soil so as to lower the electrical resistance of the volume; and then

injecting an electrically conductive second solution into the volume which diffuses through the volume and forms a water repellant electrically conductive layer bonded with soil outside of the volume.

14. A grounding electrode comprising:

a volume of soil containing an electrolyte; and

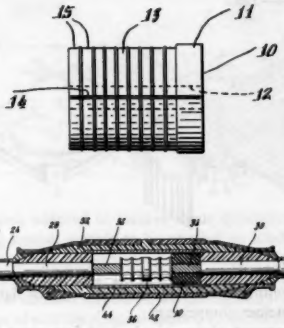
an electrically conductive asphalt emulsion layer at least partially enclosing the volume of soil.

4,192,964

MODIFIABLE STOP ELEMENT FOR CABLE CONNECTOR ASSEMBLIES

Norman M. Sacks, Westport, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed May 11, 1978, Ser. No. 905,079
Int. Cl.[2] H02G *15/08*
U.S. Cl. 174—73 R **10 Claims**



1. A splice connector assembly for electrically coupling the conductors of a pair of cables, said connector assembly comprising:

(a) a connector for coupling the exposed ends of the conductors of said cables;

(b) an outer sleeve, having an inner conductive surface, for surrounding said connector and the ends of said cables coupled thereby;

(c) bushings, each of which have a central opening for receiving therethrough one of said cables at a position spaced from said connector, for creating a seal between said cables and said outer sleeve when said connector assembly is assembled to said cables; and,

(d) a bushing stop sleeve of resilient material, having a central opening of sufficient diameter for receiving and resiliently engaging the outer surface of the exposed end of the conductor of at least one of said cables, said bushing stop sleeve abutting at one end thereof said connector and at the other end thereof the end of a bushing facing said connector in order to maintain the spacing of said bushing from said connector,

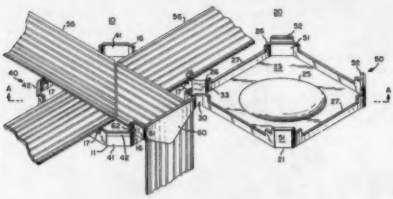
said bushing stop sleeve further having at least one outer portion, the dimension of which is such as to engage the inner conductive surface of said outer sleeve when said connector is assembled to said cables, and having at least a conductive portion for establishing a conductive path between said conductor and the inner conductive surface of said outer sleeve,

the material of said bushing stop sleeve being subject to cutting with any suitable sharp instrument to reduce the axial length thereof for fitting and maintaining a desired axial spacing between said connector and the end of said bushing facing said connector.

4,192,965
FLAT RIBBON CABLE RETAINER

Henry K. Baum, Franklin Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 29, 1977, Ser. No. 865,760
Int. Cl.[2] H02G *3/00*
U.S. Cl. 174—135 **10 Claims**



1. In combination a flat ribbon cable retainer carrying and angularly routing at least one of a plurality of flat ribbon cables, said retainer comprising:

first and second planar panels, said first panel including a plurality of first edges of a first length arranged in equidistant and spaced relationship to one another along the perimeter on said first panel, and said second panel including a plurality of first edges of a second length arranged in an equidistant and spaced relationship to one another along the perimeter of said second panel;

hinging means integrally joining said first panel to said second panel at one of said plurality of first panel first edges, and a corresponding one of said plurality of second panel first edges;

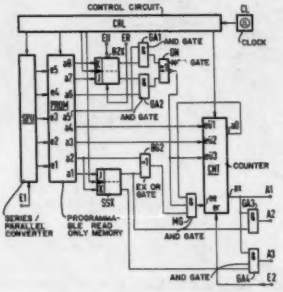
first and second latching means, each mounted on a different one of said plurality of first panel first edges and third and fourth latching means each mounted on a different one of said plurality of second panel first edges and arranged in a mutual relationship with said first and second latching means;

at least one flat ribbon cable positioned on said first panel between said hinging means and said first latching means, said cable folded upon itself and exiting said first panel between said hinging means and said second latching means, and alternatively, said cable folded upon itself and exiting said first panel between said first latching means and said second latching means, whereby said flat ribbon cable is retained in position when said second panel is rotated about said hinging means and positioned over said first panel, and said second panel third and fourth latching means interlockingly engaging said first and second latching means of said first panel.

4,192,966
CIRCUIT ARRANGEMENT FOR DETERMINING SPECIFIC CHARACTERS OCCURRING DIRECTLY CONSECUTIVELY IN A SEQUENCE OF CHARACTERS, IN PARTICULAR FOR TELEPRINTER EXCHANGE SYSTEMS

Max Mayer, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,986
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742476
Int. Cl.[2] G06F *7/02;* **H04L** *15/00*
U.S. Cl. 178—3 **12 Claims**



1. An arrangement for determining specific characters which occur consecutively in a sequence of characters, a sequence comprising at least one established sequence of characters in a predetermined number, and for emitting a message signal which can be used for triggering control processes only in response to the receipt of characters comprising an established sequence of character elements in the predetermined number, comprising:

a memory adapted to receive character elements in parallel and emit corresponding parallel first control signals indicative of the sequence of character elements;

an evaluation circuit connected to said memory and responsive to specific ones of said first control signals to provide second control signals; and

counting means connected to said memory and to said evaluation circuit, said counting means responsive to said specific control signals and identical control signals previously supplied from said memory to execute a counting process and supply a count output representative of the received character elements and responsive to said specific control signals and differing previously-supplied control signals to reset to a predetermined count.

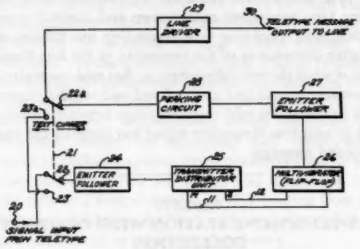
4,192,967
TELETYPE MIXER APPARATUS FOR CODING AND DECODING

Martin J. Prucha, Mountain View, Calif.; Willis L. Donaldson, and Douglas N. Travers, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1966, Ser. No. 554,286
Int. Cl.[2] H04L *9/02*
U.S. Cl. 178—22 **4 Claims**

1. In a teletype communication system, apparatus to cipher input teletype signals prior to their transmission wherein the input teletype signal represents a single character by a predetermined multiple unit pulse code inserted between an associated start and stop pulse of preselected widths comprising first switch means receiving said input teletype signals, said first switch means having two positions, and first being a cipher

position and the second a text position, with said first switch means in said first position, a resistive attenuator interconnecting a first emitter follower transistor with said first switch means, said resistive attenuator also providing bias to said first emitter follower transistor, enciphering means having a single input and a first and second output, with said input being connected to the output of said first emitter follower transistor, said means mixing in a preselected random manner said predetermined multiple unit pulse code while retaining their associated start and stop pulse in their original position, a bistable multivibrator having first and second inputs and a single output, said first and second inputs being connected to said first and second outputs, respectively, of said enciphering means, a peaking circuit interconnecting said output of said bistable multivibrator with a second emitter follower transistor, and a common emitter connected transistor operating as a driver and receiving the output signal from said peaking circuit for delivery to an output terminal for further transmission.

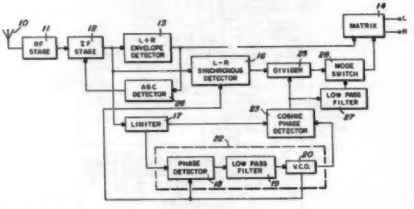


4,192,968

RECEIVER FOR COMPATIBLE AM STEREO SIGNALS

Francis H. Hilbert, Addison, and Norman W. Parker, Wheaton, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 27, 1977, Ser. No. 837,258
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GS **15 Claims**



13. A receiver for receiving a broadcast carrier wave which is amplitude modulated with signal information proportional to the sum of first (A) and second (B) intelligence signals, and which is phase modulated with a signal proportional to an angle ϕ having the form $\phi = \arctan \{c_1(A-B)/(C_2+A+B)\}$ where C_1 and C_2 are constants, the receiver comprising in combination:

input means for receiving and amplifying the broadcast carrier wave;

means coupled to the input means for translating the broadcast carrier wave to one of an intermediate frequency;

envelope detector means coupled to the translating means for providing a sum signal proportional to the amplitude modulation in the received AM stereo signal;

synchronous detector means coupled to the translating means for providing a first signal proportional to $(A-B)\cos\phi$;

corrector means for providing a second signal proportional to $\cos\phi$.

means for dividing the first signal by the second signal; and

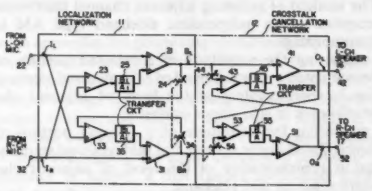
matrix means for processing the outputs of the divider means and the envelope detector means to provide separate outputs proportional to A and B.

4,192,969

STAGE-EXPANDED STEREOPHONIC SOUND REPRODUCTION

Makoto Iwahara, c/o Victor Company of Japan, Limited, No. 3-12, Moriya-cho, Kanagawa-ku, Yokohama City, Japan

Filed Sep. 7, 1978, Ser. No. 940,461
Claims priority, application Japan, Sep. 10, 1977, 52-109174
Int. Cl.[2] H04R *5/04*
U.S. Cl. 179—1 G **5 Claims**

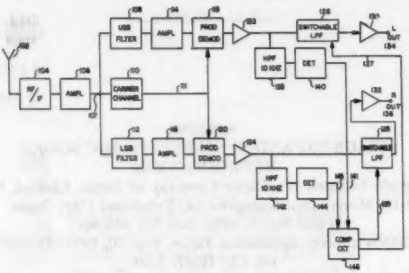


1. Apparatus adapted to receive input stereophonic signals for deriving output signals to be applied to loudspeakers in spaced relation with respect to a listener to give him a sense of an expanded stage width, comprising in each of right and left channels: first additive circuit means having a first input terminal in receipt of said input signal applied to one of the channels, a first transfer circuit means having a transfer function representative of the ratio of the accoustic transfer function of crosstalk paths to the acoustic transfer function of direct paths between hypothetical sound sources and listener's respective ears, first subtractive circuit means having a positive input terminal in recepit of the input signal applied to the other channel and a negative input terminal in receipt of a signal from the output of said first additive circuit means of said one channel to provide an output signal to a second input terminal of said first additive circuit means through said first transfer circuit means, second additive circuit means having a first input terminal in receipt of a signal from the output of said first additive circuit means, second transfer circuit means having a transfer function representative of the ratio of the acoustic transfer function of crosstalk paths to the acoustic transfer function of direct paths between said loudspeakers and the listener's respective ears, second subtractive circuit means having a positive input terminal in receipt of a signal from the output of said first additive circuit means of said one channel and a negative input terminal in receipt of a signal from the output of the second additive circuit means of the other channel to provide an output signal to a second input terminal of said second additive circuit means through said second transfer circuit means, and means for varying the magnitude of the signals supplied to the negative input terminal of the first subtractive circuit means and to the positive input terminal of the second subtractive circuit means, the signals from the output of said second additive circuit means of said channels being the signals applied to said loudspeakers.

4,192,970
REDUCTION OF ADJACENT CHANNEL INTERFERENCE

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Continuation of Ser. No. 764,476, Jan. 31, 1977, abandoned. This application Apr. 18, 1978, Ser. No. 897,305
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GS 13 Claims



1. The method of reducing adjacent channel interference in the reception of an independent sideband type AM stereo signal, comprising:

(a) measuring the amplitude of a selected portion of the demodulated upper sideband of said received stereo signal that is representative of the level of adjacent channel interference in said upper sideband;

(b) measuring the amplitude of a selected portion of the demodulated lower sideband of said received stereo signal that is representative of the level of adjacent channel interference in said sideband;

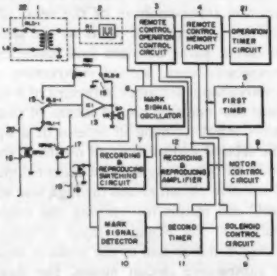
(c) comparing said measurements to develop an indication of which sideband has the greater level of adjacent channel interference; and

(d) in response to said indication, automatically reducing the audio frequency response of the stereo channel corresponding to the sideband having the greater level of adjacent channel interference.

4,192,971
REMOTE-CONTROLLABLE AUTOMATIC TELEPHONE ANSWERING DEVICE

Eiji Morigami, Yachiyo, and Motoharu Inahara, Tokyo, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Mar. 23, 1978, Ser. No. 889,437
Claims priority, application Japan, Mar. 25, 1977, 52-32064; Mar. 25, 1977, 52-32065
Int. Cl.[2] H04M *1/64, 11/10*
U.S. Cl. 179—6 E 6 Claims

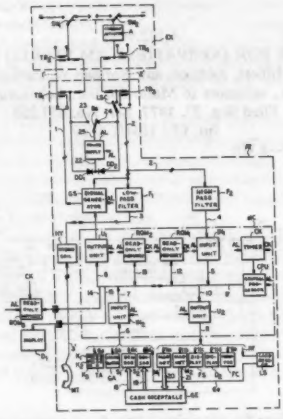


1. In an automatic telephone answering device which sends out the contents of at least one recorded message to a calling party at a remote place upon arrival of a remote control signal from said calling party after the detection of a ringing signal sent over a communication circuit, the improvement comprising: an oscillator for generating a low-frequency signal; means responsive to a first-received remote control signal to record the low-frequency signal, in a second channel developed on the same recording tape as a first channel for recording messages, in a forward direction for a predetermined period of time; a plurality of magnetic heads respectively corresponding to said first and second channels on said recording tape; a recording tape rewinding mechanism; and control means for controlling said recording tape rewinding mechanism of said device after completion of the recording of the low-frequency signal to rewind the recording tape so that said magnetic heads corresponding to said first channel and said second channel are opposite a position on said recording tape beyond the recorded position of said low-frequency signal but short of the end of a last recorded message.

4,192,972
PAY-TELEPHONE STATION WITH DEFERRED COLLECTION

Ottavio Bertoglio; Aurelio Caccia; Riccardo Fidanza, all of Turin, and Wouter M. D. VanVeen, San Maurizio Canavese, all of Italy, assignors to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A, Turin, Italy

Continuation-in-part of Ser. No. 788,757, Apr. 19, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,339
Claims priority, application Italy, Apr. 27, 1976, 68016 A/76
Int. Cl.[2] H04M *17/02*
U.S. Cl. 179—6.3 R 12 Claims



1. In a telephone pay station provided with voice-communication equipment and with selection means for transmitting call-number digits to an associated exchange preparatorily to the establishment of a talking connection via said voice-communication equipment, in combination:

payment-accepting means accommodating deposits of monetary media including payment items of different denominations;

sensing means at said payment-accepting means for detecting the number of deposited payment items of each denomination;

money-handling means at said payment-accepting means for selectively collecting payment items of any denomination and refunding uncollected deposited payment items to a user; and

computing means including a processor for controlling the

collection of deposited payment items in response to metering pulses from the exchange and for refunding any remaining balance to the user upon the termination of a talking connection, said processor comprising first register means for storing a debt accumulated from charges based on said metering pulses, second register means controlled by said sensing means for storing the number of deposited payment items of any denomination, disconnect means for cutting off a talking connection upon said debt reaching the sum of the monetary values of the deposited payment items, logical circuitry operative upon a termination of a talking connection other than through cutoff by said disconnect means for establishing different subcombinations of the contents of said second register means, arithmetic means connected to said logical circuitry for calculating the difference between said debt and the total value of the payment items represented by any of said subcombinations, and signaling means controlled by said arithmetic means for actuating said money-handling means to collect payment items corresponding to an optimum subcombination for which said total value exceeds said debt by a nonrefundable surplus ranging from zero to the smallest surplus obtained with any other subcombination established by said logical circuitry.

4,192,973

PROCESSOR OVERLOAD ARRANGEMENT IN TIME DIVISION MULTIPLEX EXCHANGES

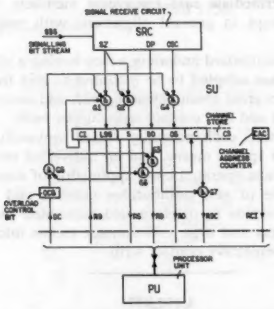
Roger M. Williams, Maidenhead, England, and Alan J. Lawrence, Stamford, Conn., assignors to Plessey Handel und Investments AG, 6300 Zug, Switzerland

Filed Jan. 13, 1978, Ser. No. 869,152

Claims priority, application United Kingdom, Jan. 18, 1977, 1875/77

Int. Cl.[2] H04Q *1/22, 11/04*

U.S. Cl. 370—53 **9 Claims**



1. A signalling unit for use in a time division multiplex processor-controlled telecommunication exchange comprising in combination;

storage means for each channel in a time division multiplex highway for storing ordinary and emergency call signalling information preparatory to being transmitted to the processor;

processor overload detection means, further comprising in combination;

means for transmitting signalling information to the processor and;

means for receiving signals from the processor; whereby when a processor-overload condition occurs, a signal is transmitted by way of the means for receiving signals to activate the processor overload detection means whereupon the transmission of signalling information from the storage means by way of the means for transmitting signalling information is inhibited except in respect of signalling information for emergency calls.

4,192,974

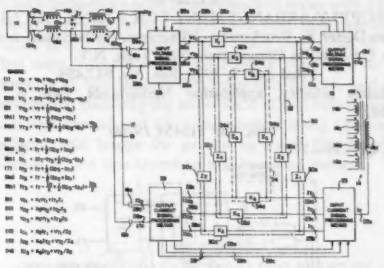
MULTI-SECTION APPARATUS FOR IMPROVING SIGNAL TRANSMISSION THROUGH TELEPHONE TRANSMISSION LINES

Frederick J. Kiko, Lorain, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Mar. 20, 1978, Ser. No. 888,501

Int. Cl.[2] H04B *3/36*

U.S. Cl. 179—16 F **47 Claims**



1. In an apparatus for producing simultaneously a multiplicity of independent non-interactive effects in the transmission characteristics of a transmission line, the combination of:

(a) output voltage signal processing means for generating an output voltage, said output voltage being applied in series with said transmission line, and for generating a plurality of feedback signals, the signal processing means having a plurality of inputs, a first output associated with said output voltage and a plurality of second outputs each associated with a respective feedback signal, each of said feedback signals being dependent upon the signal at a respective input;

(b) output current signal processing means for generating an output current, said output current being applied in shunt with said transmission line, and for generating a plurality of feedback signals, the signal processing means having a plurality of inputs, a first output associated with said output current and a plurality of second outputs each associated with a respective feedback signal, each of said feedback signals being dependent upon the signal at a respective input;

(c) input voltage signal processing means responsive to the signal voltage across said line and to said output voltage processing means feedback signals for generating a plurality of output signals, each of said output signals being dependent upon said signal voltage and upon predetermined ones of said feedback signals, the signal processing means having a plurality of feedback inputs each associated with a respective one of said feedback signals and a plurality of outputs each associated with a respective one of said output signals;

(d) input current signal processing means responsive to the signal current through said line and to said output current processing means feedback signals for generating a plurality of output signals, each of said output signals being dependent upon said signal current and upon predetermined ones of said feedback signals, the signal processing means having a plurality of feedback inputs each associated with a respective one of said feedback signals and a plurality of outputs each associated with a respective one of said output signals;

(e) a plurality of line conditioning control means responsive to the output signals of said input voltage processing means and to the output signals of said input current processing means, each of said conditioning control means having at least one input associated with a respective one

of the outputs of one of said input processing means, and at least one output associated with a respective one of the inputs of one of said output processing means;

(f) means for connecting said inputs of said line conditioning control means to said outputs of said input processing means; and

(g) means for connecting said outputs of said line conditioning control means to said inputs of said output processing means, whereby said multiplicity of independent non-interactive simultaneous effects in the transmission characteristics are produced.

4,192,975

SUPPLY-ARRANGEMENT FOR A LINE CIRCUIT

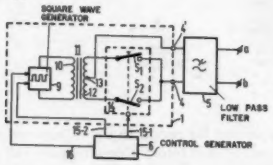
Klaus-Dieter K. Brockmann, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,454

Claims priority, application Netherlands, Feb. 6, 1978, 7802423

Int. Cl.² H04M *19/00*

U.S. Cl. 179—77 **8 Claims**



1. A supply arrangement for a line circuit of a telephone system, comprising a high frequency pulse source including bipolarity switching means and an output at which high frequency pulses of either positive or negative polarity are produced, means coupling said output to a two-wire subscriber's line via a low-pass filter having a cut-off frequency that is low relative to the frequency of the pulse source, and a control signal generator having an output coupled to said switching means for supplying control signals to the switching means for controlling the mark-space ratio of the pulses produced by the high frequency pulse source.

4,192,976

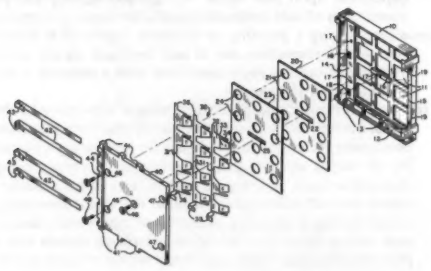
PUSHBUTTON CALL TRANSMITTER

James Scott, Huntsville, Ala., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 29, 1978, Ser. No. 974,398

Int. Cl.² H04M *1/50*

U.S. Cl. 179—90 K **13 Claims**



1. A pushbutton controlled switching mechanism comprising: a frame having a plurality of apertures therein arranged in an array of longitudinal columns and transverse rows, said frame including inner and outer surfaces and a pair of rectangular members, each of said members transversely oriented and integrally mounted on opposite ends of said frame inner surface, each of said transverse members including a planar bottom surface and a inner side wall, said inner side walls including a plurality of vertically oriented contact spring receiving channels;

a bearing guide mounted to said frame inner surface intermediate said transverse members, including a plurality of apertures arranged in longitudinal columns and transverse rows, each of said bearing guide apertures in central alignment with each of said frame apertures;

a plurality of pushbuttons, each of said pushbuttons adapted to be positioned within a different one of said frame apertures and each including an actuating section positioned within a different one of said bearing guide apertures;

a plurality of contact spring members, each of said contact spring members including a conductor strip portion with first and second ends and a plurality of pushbutton spring means and electrical contact means integrally joined to and coactive with said pushbutton spring means intermediate said conductor portion first and second ends, said conductors second end further including an angularly displaced wiper contact end, each of said contact spring members adapted to be longitudinally mounted intermediate said frame transverse members with said first and second ends inserted within opposite and respective transverse member receiving channels, each of said spring means in general alignment with a respective one of said bearing guide apertures, and associative with one of said pushbutton actuating members, and said wiper contact ends extending inward and over said transverse member bottom surface;

a backplate including an inner and outer surface, said inner surface including a plurality of transversely oriented parallel and spaced apart contact strips, each contact strip further including a formed wiper contact end, each of said wiper contact ends terminating over said backplate outer surface, said backplate adapted to be mounted to said frame intermediate said transverse members with said contact strips in general alignment with said contact means;

a printed circuit board including a face having a plurality of contact areas adapted to be mounted to said frame with said contact areas communicating with said contact spring wiper ends and said contact strips wiper ends;

said pushbuttons each normally biased upwardly by said pushbutton spring means, and an individual one of said contact means operated upon application of manual pressure to one of said pushbuttons causing said included actuating section to displace said associated pushbutton spring means and urge said contact means into contact with said respective contact strip.

4,192,977

HIGHLY DIRECTIONAL ULTRASONIC ELECTRET TRANSDUCER

Kurt Stamm, Vienna, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H., Austria

Filed Dec. 16, 1977, Ser. No. 861,342

Claims priority, application Austria, Dec. 20, 1976, 9440/76

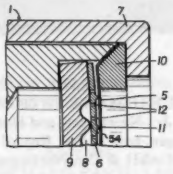
Int. Cl.² H04R *1/34, 19/00*

U.S. Cl. 179—111 E **7 Claims**

1. An ultrasonic converter having single side, focused, substantially secondary radiation free directional characterstic, comprising a horn-like directional element with an inner end and an outer opened end and walls extending outwardly toward the outer opened end preferably according to an exponential function, a capacitive transducer located in said horn-like directional element adjacent to and closing off its inner end and having an electret diaphragm facing toward the outer end of said horn-like element with a diaphragm edge, said diaphragm including means for producing an approximately bell curved velocity distribution thereon tapering off toward the

diaphragm edge, said means for producing an approximately bell-curved velocity distribution comprising a distribution of the electret charge on said diaphragm corresonding to an approximately bell-curved diaphragm velocity distribution tapering off toward the edge of the diaphragm.

5. An ultrasonic converter having a single side, focused, substantially directional characteristic free from secondary maxima, comprising a tubular horn-like element having a tubular wall with an inner end and an outer open end and a wall between said outer and inner ends tapering outwardly to said



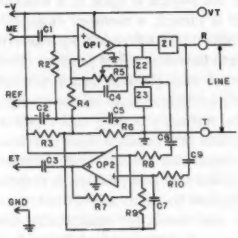
outer end in a curve according to an exponential function, an electret converter in said horn-like element adjacent said inner end and having a housing with a diaphragm on a side of said housing facing toward said outer end, a diaphragm support member in said housing behind said diaphragm with a support face having projecting portions and hollow portions between the projecting portions, a counterelectrode disc having an inner face engaged on said support projecting portions and having an outer face with electrode disc projections urged against said diaphragm.

4,192,978

OPERATIONAL AMPLIFIER HYBRID SYSTEM

Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008

Filed Feb. 27, 1978, Ser. No. 882,057
Int. Cl.[2] H04B 1/58
U.S. Cl. 179—170 NC **13 Claims**



1. A hybrid circuit comprising:

a first operational amplifier having an input and an output which has a very low impedance, the input of said first operational amplifier being connected to a first line, the output of said first operational amplifier being connected to an impedance bridge for sending outgoing signals to a two-wire transmission line, said first amplifier having a single ended output with an amplifier return path to a common point,

a second operational amplifier having a differential input with high impedances, said second operational amplifier having a non-inverting input and an inverting input, the output of said second amplifier being connected to a second line, said inputs of said second amplifier being connected to said impedance bridge for receiving incoming signals from said two-wire transmission line wherein said inputs are balanced with respect to said bridge and to said common point, said second amplifier having a single ended output with an amplifier return path to said common point, and

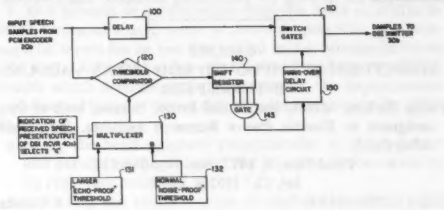
said impedance bridge having a first branch and a second branch, the top of said first branch and the top of said second branch each being connected to the output of said first amplifier, the bottom of said first branch and the bottom of said second branch each being connected to said common point, said first branch including a first impedance in series with the first wire of said two-wire transmission line, said bridge being capable of interfacing said two-wire line, the second wire of said two-wire line being connected to said common point, said second branch including a second impedance in series with a third impedance wherein said second and third impedances are equal, said non-inverting input being connected to said first wire, said inverting input being connected to the junction of said second and third impedances, said first impedance matching the impedance of said two-wire line, and said second and third impedances being selected to balance said bridge for producing equal first amplifier signals at said non-inverting and inverting inputs.

4,192,979

APPARATUS FOR CONTROLLING ECHO IN COMMUNICATION SYSTEMS UTILIZING A VOICE-ACTIVATED SWITCH

Joseph Jankowski, Jr., Silver Spring, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jun. 27, 1978, Ser. No. 919,520
Int. Cl.[2] H04B 3/20
U.S. Cl. 179—170.2 **12 Claims**



1. Apparatus for blocking echo signals in a telephone communications circuit comprised of individual channels for transmission and reception of voice signals between telephone terminals, said apparatus comprising:

(a) means for sensing the presence of received voice signals in the receive channel of a circuit at one terminal;

(b) comparison means for comparing signals to be transmitted from said terminal to a selectable threshold level and indicating if said transmitted signal exceeds the selectable threshold level;

(c) means responsive to said sensing means for selecting either a first threshold level or a second threshold level, said first threshold level being greater in magnitude than the level of noise in said transmission channel and said second threshold level being higher in amplitude than said first level and greater than that of said echo signals said second level being selected upon the detection by said sensing means of the presence of received voice signals in said receive channel at said terminal; and

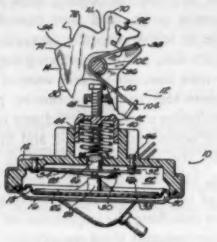
(d) inhibiting means responsive to said comparison means for inhibiting transmission of said voice signals to be transmitted in the transmit channel of said circuit at said terminal unless said comparison means indicates that said voice signals to be transmitted exceed said selected threshold level.

4,192,980

AUTOMATIC RE-SET PRESSURE SWITCH

Erich Kothe, Schaumburg, Ill., assignor to The Singer Company, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,997
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—83 WM 10 Claims



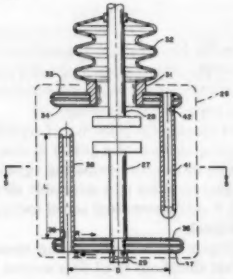
1. In combination with a pressure switch having a switch actuated by a diaphragm moved by pressure against the pre-load force of a spring which is seated against a member positioned by means of manually actuateable and settable cam means to provide for various pre-load forces on the spring corresponding to values above and below a medium value, the improvement of, means biasing the cam means back to the medium setting from settings above medium, and providing means operative to prevent movement of the cam means under influence of the biasing means and moveable to a position allowing the cam means to move back to the medium setting, and means for moving the preventing means to said position.

4,192,981

STRUCTURALLY IMPROVED ROD ARRAY VACUUM INTERRUPTER

Philip Barkan, Media, and Imdad Imam, Secane, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 4, 1977, Ser. No. 848,512
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B 6 Claims



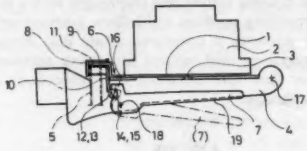
1. A high current rod array interrupter, comprising
a sealed enclosure having opposite ends,
a first pair of thin spaced rod mounting plates disposed toward one end of said sealed enclosure,
a second pair of thin spaced rod mounting plates disposed toward the other end of said sealed enclosure,
a stationary contact extending through said one end in electrical contact with said first pair of mounting plates,
a moving contact sealably extending through said other end in electrical contact with said second pair of mounting plates and movable between position in contact with and remote from said stationary contact,
a plurality of elongate rods mounted in each of said first and second pairs of thin spaced mounting plates extending toward the opposite end of said sealed enclosure therefrom,
said first and second pairs of plates being spaced sufficiently so that lateral force exerted at the free end of said rods produces substantially only compressive and tensile stress in said thin plates.

4,192,982

DEADMAN'S SWITCH

Albrecht Schnizler, Jr., Nuertingen, and Hermann Kieser, Nuertingen-Oberensingen, both of Fed. Rep. of Germany, assignors to Metabowerke GmbH & Co., Nurtingen, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,546
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736613
Int. Cl.[2] H01H *3/20*
U.S. Cl. 200—157 23 Claims



1. A switch, particularly a deadman's switch, comprising an actuating element movable against a biasing force from a rest position in which the switch is open to a working position in which the switch is closed; a member engageable with said element and movable under a force of a predetermined magnitude applied thereto between a first position corresponding to said rest position of said element and a second position in which it displaces said element into said working position; first resilient means for normally urging said member against the applied force into said first position so as to release the actuating element and open the switch, said member tending to prematurely move into said first position in response to a slight decrease of the applied force to a level below said predetermined magnitude: and means for maintaining said member in said second position when the applied force decreases above said level and allowing said member to move into said first position once the applied force decreases below said level.

4,192,983

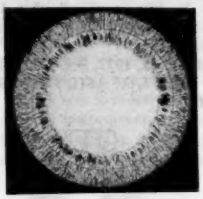
METHODS OF HARD FACING

Alfred J. Paoletti, Willingboro, N.J., assignor to Cabot Corporation, Kokomo, Ind.

Filed May 2, 1978, Ser. No. 902,069
Int. Cl.[2] B23K *35/30*
U.S. Cl. 219—76.1 6 Claims

1. A method of hard surfacing a metal article comprising the steps of:
a. forming a metal boride layer in situ on an electrode wire; and
b. forming at least one layer of weldment on a surface of an article to be coated by depositing said electrode wire onto

said surface by a welding technique simultaneously to melt the wire and metal boride into an alloy coating of



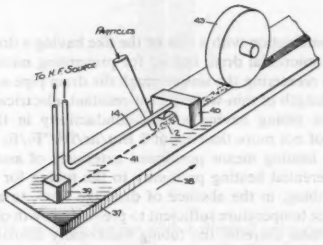
substantially uniform boron containing composition and fuse the same to said surface.

4,192,984

EMBEDMENT OF HARD PARTICLES IN A METAL SURFACE

Wallace C. Rudd, New Canaan, Conn., assignor to Thermatool Corporation, Stamford, Mass.

Filed Jul. 12, 1978, Ser. No. 923,777
Int. Cl.² B23K *9/04, 11/00*
U.S. Cl. 219—76.17 **34 Claims**



1. A method of embedding a plurality of discrete particles in a surface area of a structurally continuous metal part, said particles being particles of a material having a melting point higher than, and mechanical properties different from, the metal of said part, said method comprising:

contacting said metal part with a first contact means at one end of said area and with a second contact means at the opposite end of said area thereby to define the length of said area, the dimension of said area in the plane of said surface and perpendicular to the length of the area being the width dimension of said area;

rapidly heating the metal of said area at least to the melting temperature thereof by supplying electric current having a frequency of at least 3000 Hz to both said contact means, and hence, to said metal part, the current being supplied to at least one of said contact means through relatively long and narrow proximity conductor means which overlies substantially the length of said area between said contacts with the length thereof extending parallel to the length of said area, which is spaced from the surface of said area by not more than five times the width of said proximity conductor means in the direction substantially parallel to the surface of said area and perpendicular to said length of said area and which is connected to said contact means so that the current therein, at any instant, flows oppositely to the flow of current in said metal part to cause the current to concentrate in said area as close as possible to said conductor and thereby melt metal in said area having a width approximating the width of said conductor without melting metal of the part outside of such melted metal;

inserting said particles of said material into the metal of said area while it is molten; and

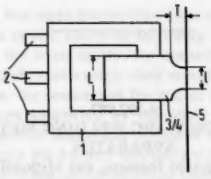
cooling said metal to thereby form an area at the surface of said metal part which comprises discrete particles of said material embedded in a solid matrix of said metal, said cooling being caused before most of said particles can completely melt and so that at least most of the added particles continue to exist even though surface portions thereof may have melted.

4,192,985

METHOD FOR THE PRODUCTION OF INTEGRATED MAGNETIC HEAD STRUCTURES

Winfried Berghof, Taufkirchen, and Alfred Pichler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,487
Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721201
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 EM **2 Claims**



1. In a process of producing a magnetic head structure in which a magnetic pole piece of alternate magnetic and non-magnetic layers has an end face milled by ion bombardment at right angles to the face, from an original breadth to a smaller breadth which determines the track breadth, the improvement for definitive fixing of the smaller breadth comprising the steps of:

masking the head structure perpendicular to the end face and parallel to the planes of the layers to expose areas to be removed; and

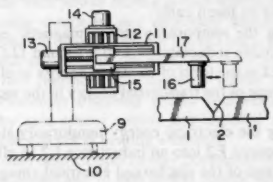
bombarding the exposed areas through the mask at right angles to the planes of the layers.

4,192,986

METHOD AND APPARATUS FOR AUTOMATIC WELD LINE TRACING

Tsugio Udagawa, Tomobemachi; Takeshi Araya, Shimoinayoshi, and Takashi Yoshida, Minorimachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Seiko, Ltd., both of, Japan

Filed Aug. 9, 1977, Ser. No. 823,196
Claims priority, application Japan, Aug. 18, 1976, 51/97718
Int. Cl.² B23K *9/12*
U.S. Cl. 219—137 R **8 Claims**



1. In a method for automatic weld line tracing wherein the welding torch traces a groove formed between two base metals

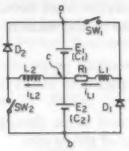
which are to be welded in accordance with the output voltages E of a sensor reciprocating back and forth in a contactless way over the base metals across the groove thereof, wherein the magnitude of the output voltage E varies inversely with the distance of the sensor from the base metal which the sensor is passing over, said method comprising detecting output voltages E_1 and E_2 of the sensor which are the output voltages at the respective ends of said groove each time the sensor passes over the groove, thereby indicating the distance of the sensor above each of the ends of the groove, comparing the output voltages E_1 and E_2 with each other to determine which voltage is lower, setting a voltage equal to the difference of the lower of said two voltages E_1 and E_2 and a reference voltage δ i.e., $E_1-\delta$ or $E_2-\delta$, determining an output voltage Ps equivalent to the center of said groove from said voltage value $E_1-\delta$ or $E_2-\delta$, producing the difference between said voltage Ps representing the center of said groove and a predetermined voltage representing the center of sensor reciprocation, and tracing said groove in such a manner as to eliminate said difference thereby to align the welding torch with the groove.

4,192,987

HIGH FREQUENCY ARC WELDING METHOD AND APPARATUS

Hitoshi Kawano; Kiyoshi Ikemura, and Mithuhilo Hayashi, all of c/o Shinko Electric Co., Ltd., Ise Factory, 100, Takehanacho, Ise-shi, Mie, Japan

Filed Sep. 22, 1977, Ser. No. 835,528
Claims priority, application Japan, Nov. 1, 1976, 51/132172
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—137 PS **7 Claims**



1. A high-frequency arc welding method comprising the steps of

applying a voltage from a D.C. electrical source E1 of an arc welding machine across an electrode of the machine and a workpiece to establish an arc welding current between the electrode and workpiece;

intermittently disconnecting the electrical source E1 thereby effecting temporary storage of magnetic energy in the inevitable inductance L1 inherent in the arc welding machine and its torch cable;

transferring the temporarily stored magnetic energy from the inevitable inductance L1 to a second D.C. electrical source E2 in the form of electrical energy to effect temporary storage of the transferred energy in the second source E2;

discharging the electrical energy temporarily stored in the second source E2 into an inductance L2 to effect temporary storage of the discharged electrical energy in inductance L2 in the form of magnetic energy; and

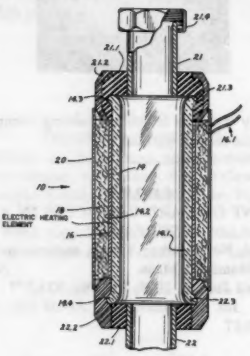
effecting conversion of the magnetic energy temporarily stored in inductance L2 into electrical energy and regenerative transfer of the thusly converted energy back into the first D.C. electrical source E1.

4,192,988

ELECTRICALLY HEATED THERMAL MICROBIAL DRAIN BARRIER

Paul D. Pederson, Jr., Minnetonka; Keith A. Ufford, Osseo, and Lawrence V. Nelson, Anoka, all of Minn., assignors to Foto-Mark, Inc., Egan, Minn.

Filed Jul. 11, 1977, Ser. No. 814,644
Int. Cl.[2] H05B *1/00*; A61L *1/00*; E03C *1/28*
U.S. Cl. 219—201 **3 Claims**



1. In combination with a sink or the like having a drain pipe, a thermal microbial drain barrier for preventing microorganisms from reentering the sink through the drain pipe and comprising a length of thin-walled, heat-resistant, electrically nonconductive tubing having a heat conductivity in the axial direction of not more than about 3 Btu/hr/ft^2/°F./ft;

electric heating means positioned exteriorly of and in circumferential heating proximity to the tubing for heating the tubing, in the absence of drainage flow, to an inner surface temperature sufficient to prevent growth of microorganisms thereon, the tubing electrically insulating the electric heating means from the inner surface of the tubing; and

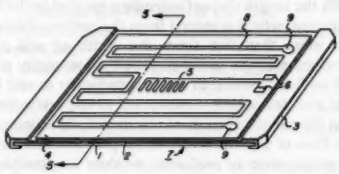
mounting means mounting the tubing in the drain pipe in a manner requiring drainage from the sink or the like to pass through the tubing, the mounting means comprising connector pipes extending axially outwardly from the tubing and connecting the latter into the drain pipe of the sink or the like, and means joining the connector pipes to the tubing including insulating means electrically insulating the pipes from the electric heating means and thermally insulating said tubing from the connector pipes.

4,192,989

BLANKET HEATED PHOTORECEPTOR

Lothar S. Jeromin, Sierra Madre, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 813,037
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **4 Claims**



1. An improved xeroradiographic plate having a heating

member attached thereto for relaxing xeroradiographic plates, each xeroradiographic plate comprising a substrate and a photoreceptor layer overlying said substrate comprising:

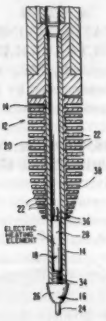
a thermofoil type heating member which is attached to said substrate and in thermal contact therewith, said thermofoil member comprising a current resistive layer which upon electrical energization converts electrical energy into thermal energy and first and second layers disposed on opposite sides of said current resistive layer, said first and second layers comprising a high dielectric strength, high temperature resistant sheet material.

4,192,990

TIP ASSEMBLY FOR USE WITH A THERMAL PRESS

Theodore Ziaylek, Jr., Yardley, Pa., assignor to Yardley Products, Inc., Yardley, Pa.

Filed Jul. 11, 1977, Ser. No. 814,361
Int. Cl.[2] H05B *3/02*; B30B *15/34*
U.S. Cl. 219—243 **8 Claims**



1. A tip assembly for use with a thermal press comprising:

(a) a longitudinally extending core member formed of thermally conductive material and being of an approximately constant lateral diameter longitudinally therealong;

(b) a tip element adapted to be securely held at one end of said core member to be heated by a heating means associated with said core member, said tip element including a protruding finger member of a lateral diameter less than the lateral diameter of said core member, the remaining portion of said tip element entirely comprising a paraboloidal section adjacent to said finger member to facilitate the concentration of heat flow from the heating means to said finger member, said paraboloidal section having a gradually increasing diameter from the location adjacent said protruding finger member to the location of termination thereof adjacent said core member, the diameter of said paraboloidal section adjacent said protruding finger member starting at a diameter approximately equal to the diameter of said protruding finger member and gradually increasing parabolically to the point of termination thereof adjacent said core member where the diameter of said paraboloidal section is greater than the diameter of said core member:

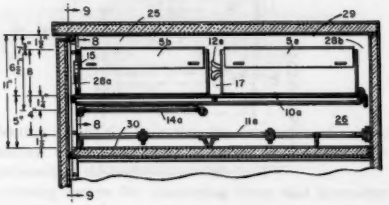
(c) a heating means held by said core member and positioned thermally adjacent said tip element to selectively cause heating thereof; and heat dissipation means positioned around said core member to facilitate dissipation of heat from said tip element and said core member, said heat dissipation means including a plurality of spaced outwardly extending, disks forming an upwardly extending envelope of generally paraboloidal overall outer configuration to facilitate dissipation of heat from said tip assembly.

4,192,991

OVEN FOR COOKING MEAT ROASTS

Leo Peters, 750 Plymouth Rd. SE., Grand Rapids, Mich. 49506, and Richard O. Klemm, 4312 Valley View Rd., Crystal Lake, Ill. 60014

Filed Apr. 7, 1978, Ser. No. 894,407
Int. Cl.[2] A21B *1/00*
U.S. Cl. 219—413 **5 Claims**



1. A radiant heat oven for cooking three or more meat roasts within a single cavity, the oven including a heat sensor positioned within the oven cavity, for controlling a low power density heating element a single shelf mounted within the oven cavity between the sensor and the top of the oven cavity so that meat roasts supported by the shelf are approximately midway between the sensor and the top of the oven cavity, the distance between the bottom and the top of the oven cavity being about 11 inches, said shelf being located about 6¼ inches from said top of the oven cavity, said heat sensor being located underneath said shelf at a distance of about 1¼ inches from said shelf, the distance between said sensor to the top of the oven cavity being about 7¾ inches, and said low power density heating element having a wattage emission of 10 watts or less per square inch of element surface located adjacent to, and spread substantially across, the bottom of said oven cavity at a distance from said shelf of about 4 inches.

4,192,992

ELECTRIC HEATING ASSEMBLY FOR A FUSED BATH

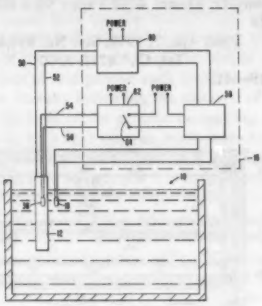
John M. Stevens, Detroit; Grant W. Allen, Northville; John M. Cole, Redford, all of Mich., and Timothy K. Mousseau, Sante Fe Springs, Calif., assignors to Kolene Corporation, Detroit, Mich.

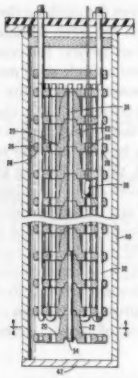
Filed Jun. 29, 1978, Ser. No. 920,486
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—494 **3 Claims**

1. In an electrical heating assembly for heating a fused salt bath in an enclosure wherein electrical heating elements are supported on electrically insulating ceramic spacer means within sealed heat conductive enclosure means, and supplied through leads with power from a power source through electrical insulating means in said enclosure means, and which enclosure means is disposed within the salt bath, and means for mounting said assembly in the bath, the improvement which comprises, first thermocouple disposed within the salt bath, second thermocuple disposed within said enclosure means supported by said spacer means and exposed to the direct radiation from electrical heating elements,

and electrical control operatively connected to each of said thermocouples and to said power source through electrical leads, said control means being arranged to control the power supplied to the electrical heating elements responsive to the temperature sensed by said first thermocouple and to remove the power supplied to the electrical heating elements and thereby over-ride the control of said first

thermocouple and prevent excessive heating of the electrical heating elements irrespective of the bath temperature





responsive to a given temperature sensed by said second thermocouple.

4,192,993

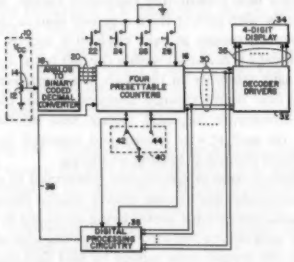
STATIC DIGITAL DATA ENTRY METHOD AND APPARATUS FOR A TIMER OR CLOCK

Reuben Wechsler, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 763,399, Jan. 28, 1977, abandoned. This application Jan. 31, 1979, Ser. No. 8,201

Int. Cl.[2] H03K *21/36*

U.S. Cl. 235—92 DE **11 Claims**



1. A digital data entry method for visually displaying a digital representation of an operator desired number which comprises:

(a) positioning manually and approximately a first mechanical member for converting a mechanical position into a steady state electrical analog signal having a first magnitude;

(b) converting said steady state electrical analog signal to a binary coded representation having a second magnitude, said second magnitude being in a predetermined relationship with said first magnitude;

(c) displaying digitally a first representation of said binary coded representation to the operator for identification; and

(d) repositioning said mechanical member and repeating steps (b) and (c) until said digital representation corresponds to the operator desired number.

4,192,994

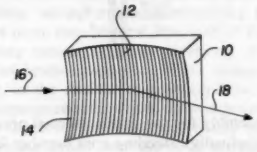
DIFFRACTOID GRATING CONFIGURATION FOR X-RAY AND ULTRAVIOLET FOCUSING

Sidney O. Kastner, Greenbelt, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 18, 1978, Ser. No. 943,089

Int. Cl.[2] G01N *23/20;* **G21K** *1/06*

U.S. Cl. 250—280 **13 Claims**



1. A diffractord grating means for obtaining stigmatic imaging of a soft X-ray and extreme ultraviolet emitting object at a focal point, comprising;

a support block;

a concave surface formed on a portion of said support block, said concave surface having a non-constant radius of curvature over the entirety thereof, and said non-constant radius of curvature surface having a surface of revolution about a coordinate axis defined by a diffractoidal curve specified in terms of cartesian coordinates x and z having a characteristic such that for a selected grating parameter (A) defined in terms of diffraction order (m), wavelength (λ) and ruling interval (σ), all emitted radiation of a specified wavelength from a point source directed substantially parallel to said axis will be deflected to a sharp point at said focal point and conversely, all emitted radiation of said specified wavelength directed from said sharp point at said focal point located at the origin of said cartesian coordinates will be deflected substantially parallel to said axis; and

diffraction rulings formed on said non-constant radius of curvature surface having a ruling interval (σ);

wherein said diffractoidal curve is defined by a solution of a non-linear differential equation expressed in the form

$$m\lambda/\sigma=[1+(dx/dz)^2]^{-\frac{1}{2}}[\cos\theta_r+\sin\theta_r(dx/dz)-1]$$

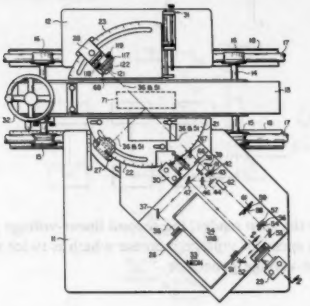
where dx/dz is the derivative of x with respect to z, θ_r is the angle a ray (r) from the origin to a point on said curve makes with the z coordinate axis.

4,192,995

PHOTOMETRIC TESTING APPARATUS USING SHAPED DIFFUSER AND LIGHT BEAM HAVING A SPATIALLY ILL-DEFINED ENERGY DISTRIBUTION

Erik W. Anthon, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Feb. 21, 1978, Ser. No. 879,149
Int. Cl.[2] G01J *1/00;* G01N *21/00;* G02B *13/20*
U.S. Cl. 250—338 **16 Claims**



9. In a testing apparatus for making photometric measurements on a test part, means for producing an invisible light beam, means for producing a visible light beam, means for combining the visible and invisible light beams so that they are coaxial, a reference detector characterized in that its sensitivity varies spatially over its sensitive area, means for aiming the combined visible and invisible light beams before they impinge upon the test part onto the reference detector, a signal detector characterized in that its sensitivity varies spatially over its sensitive area, means for aiming the combined visible and invisible beams so that they impinge upon the test part and means for directing the visible and invisible beams onto the signal detector after they have impinged upon said test part so that a comparision can be made from the output from the reference detector and the output from the signal detector to determine the manner in which the invisible beam is affected by impingement of the test part and diffuser means interposed in the path of the combined beams so that the combined beams pass through the diffuser means before impinging upon the reference and signl detectors, said diffuser means being formed with differing thicknesses in a direction parallel to the direction of passage of the combined beams through the diffuser means to compensate for the spatial variation in sensitivity of the reference and signal detectors.

4,192,996

MEASUREMENT OF OXYGEN BY DIFFERENTIAL ABSORPTION OF UV RADIATION

Melvyn N. Kronick; Charles E. Bryson, III; John A. Bridgham, all of Palo Alto, and Sam H. Eletr, Berkeley, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

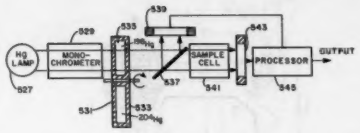
Filed Jul. 12, 1978, Ser. No. 923,844
Int. Cl.[2] G01J *1/42*
U.S. Cl. 250—373 **23 Claims**

1. A device for measuring the concentration of O_2 in a sample comprising:

source means for providing a primary UV radiation beam from an atomic transition of an element at a nominal wavelength in a spectral region where the transmissivity of oxygen is rapidly varying, said beam including at least one transition line of a first isotope of said element at a wavelength higher than said nominal wavelength, and at least one transition line of a second isotope of said element at a wavelength lower than said nominal wavelength;

shifting means for producing from said primary radiation beam a short-shifted radiation beam having an intensity distribution weighted toward said isotope line of wavelength lower than said nominal wavelength, and producing a long-shifted radiation beam having an intensity distribution weighted toward said isotope line of wavelength higher than said nominal wavelength;

beam directing means for directing said long-shifted and short-shifted radiation beams through said sample;



detection means for detecting the intensities of said long-shifted and short-shifted radiation beams having been transmitted through said sample; and

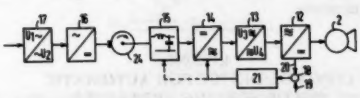
processing means for calculating from said intensities an indication of the concentration of oxygen in said sample.

4,192,997

TOMOGRAPH FOR PRODUCING TRANSVERSE LAYER IMAGES

Heinz Baumann, Buckenhof, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,427
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750633
Int. Cl.[2] A61B *6/00;* H05G *1/08, 1/20*
U.S. Cl. 250—445 T **5 Claims**



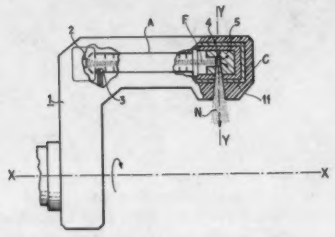
1. Tomographic apparatus for producing transverse layer images of an exposure subject, with an X-ray source, and X-ray generator including a high voltage transformer supplying the X-ray source to produce an X-ray beam penetrating the exposure subject, of which the cross-sectional extent perpendicular to the layer plane is the same as the layer thickness, with a radiation receiver which determines the radiation intensity behind the subject by scanning the projected X-ray beam, with a rotating frame for rotating the X-ray source in the layer plane to scan the exposure subject in different directions and with a measured value converter to transform the signals supplied by the radiation receiver into a layer image, characterized in that a medium frequency generator (**14**) supplies the high voltage transformer with a medium frequency which is higher than the mains frequency, that at least the structural elements on the high voltage side (**12, 13, 18, 21**) of the X-ray generator (**12** to **21**) are fixed along with the medium frequency generator (**14**) on the rotating frame (**4**) and that a rotating current coupling (**24**) is provided to transfer the energy between the rotating frame (**4**) and a stationary energy supply apparatus (**16, 17,** FIG. **5**; or **17,** FIG. **6**).

4,192,998

NEUTRONTHERAPY APPARATUS USING A LINEAR ACCELERATOR OF ELECTRONS

Guy Azam, Paris, France, assignor to C.G.R.MeV, Buc, France

Filed Feb. 6, 1978, Ser. No. 875,576
Claims priority, application France, Feb. 8, 1977, 77 03478
Int. Cl.[2] G21G *4/02*
U.S. Cl. 250—502 **7 Claims**



1. A neutrontherapy apparatus comprising a linear accelerator for accelerating electrons emitted by an electron source, a target intended to be bombarded by said beam of accelerated electrons for emitting neutrons under the impact of said accelerated electron beam, means for cooling said target, means for eliminating the parasitic radiations produced by the bombardment of said target, a collimation system for the useful beam of neutrons and control means for controlling the characteristics of the useful beam of neutrons, the useful beam of neutrons and control means for controlling the characteristics of the useful beam of neutrons, said target being accommodated in a block of a highly heat-conductive material, said block being provided with a circulation system for a cooling fluid, said block comprising a first passageway for the passage of said accelerated electron beam and a second passageway for the passage of said useful beam of neutrons, said block being arranged inside an assembly of protective shields which are capable of stopping the parasitic photons and which are accommodated in a protective block capable of arresting the parasitic neutrons, said protective block being made of a material of high hydrogen content, said shields and said protective block being provided with orifices providing respectively for the passage of the beam of accelerated electrons and the passage of the useful beam of neutrons.

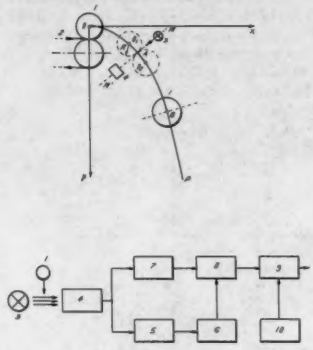
4,192,999

CONTROL DEVICE FOR AUTOMATIC COLOR-SORTING APPARATUS

Georgi P. Krivoshiev, Sofia, Bulgaria, assignor to DSO "Bulgarplod", Sofia, Bulgaria

Filed Jul. 18, 1978, Ser. No. 925,647
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—561 **3 Claims**

1. A control device adapted for use with an automatic color-sorting machine wherein a plurality of different objects move sequentially along a path which includes a testing area, said control device insuring the synchronization of the testing operations performed by the machine with coincidence between the geometric center of each object and the center of the testing area, said control device including a light source and a photorelay spaced from each other on opposite sides of the path of the objects, the light beam from the light source being directed toward the photorelay and interrupted by the passage of each object, and a computing circuit coupled to the photorelay, said computing circuit comprising a first linear-voltage generator, a second linear-voltage generator, circuit means coupling the output of the photorelay to the respective inputs of the first and second generators, a memory device, circuit means coupling the output of the first generator to the memory device, an adder, circuit means coupling the adder to the outputs of the memory device and the second generator, a reference voltage source, a zero reader, and circuit means connecting the outputs of the adder and of the reference voltage source to the zero reader, the second linear-voltage generator having a speed of voltage-increase which is twice that of the first linear-voltage generator.

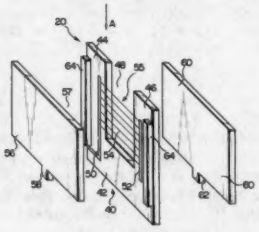


4,193,000

RADIATION DETECTOR ADAPTED FOR USE WITH A SCANNER

Shimpey Shirayama; Chikara Konagai; Michitaka Terasawa, all of Yokohama, and Hironobu Kimura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 23, 1977, Ser. No. 854,255
Claims priority, application Japan, Nov. 25, 1976, 51-140674
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—385 **11 Claims**



1. A radiation detector which comprises an electric charge-collecting electrode constructed by arranging a plurality of fine metal wires in substantially the same plane; a pair of high voltage electrodes disposed substantially parallel with both sides of the electric charge-collecting electrode; and a case designed to receive the electric charge-collecting electrode and paired high voltage electrodes, filled with a gaseous element substantially impervious to radiation and provided with a radiation supply section enabling radiation to be introduced substantially parallel with said plane of the electric charge-collecting electrode.

4,193,001
TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

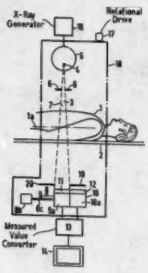
Reiner Liebetruth, and Norbert Mika, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 16, 1978, Ser. No. 934,167

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741732

Int. Cl.[2] A61B *6/02*

U.S. Cl. 250—445 T **5 Claims**



1. Tomographic apparatus for producing transverse layer images of a radiography subject, having a radiation measuring arrangement comprising a source of radiation producing a fan-shaped radiation beam which penetrates the radiography subject, whose cross-sectional extent perpendicular to the layer plane equals the layer thickness and in the layer plane is so great that the whole radiography subject is penetrated, and also a radiation receiver which determines the intensity of radiation behind the subject, and also having a rotating device for the measuring arrangement for the purpose of irradiating the radiography subject from different directions, and having a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, where the radiation receiver consists of a number of individual detectors, characterized in that the radiation receiver (8) has two or more rows of detectors (9, 10), each of which is assigned to a specific area of the body, the length of each row of detectors (9, 10) corresponding to the associated area of the body, in that the number of detectors per unit of length of said rows of detectors (9, 10) is greater the shorter the length of the row of detectors (9, 10), and in that there is a control device (8*b*, *c*) for the radiation receiver (9) which enables the x-ray beam to be detected selectively by one of said rows of detectors (9, 10) respectively.

4,193,002
DENTAL X-RAY DIAGNOSTIC INSTALLATION

Manfred Muether; Tilman Phleps, and Ernst Schmitt, all of Bensheim, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

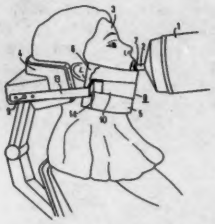
Filed May 15, 1978, Ser. No. 905,792

Claims priority, application Fed. Rep. of Germany, May 23, 1977, 2723243

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—479 **12 Claims**

1. A dental x-ray diagnostic installation of the type where x-rays are to originate exclusively from interiorly of the oral cavity, and comprising an applicator assembly including a housing and an applicator capable of insertion into the mouth of the patient which applicator exhibits an exit window from which x-radiation can issue and expose an x-ray film applied externally of the patient's mouth, characterized in a flexible x-ray film cassette (5) having first and second means (7; 8, 13) for removably holding the x-ray film (6) in a defined position relative to the applicator (2) and the patient's mouth, said first means (7) holding the x-ray film (6) in place by engagement with the applicator (2), and comprising a part having applicator-engaging means (7) in the form of a loop or hook configuration for at least partly encircling the applicator and for embracing opposite sides of the applicator to locate the x-ray film (6)



relative to the applicator while conforming of the cassette to the patient both adjacent the applicator-engaging means and remote therefrom, and said second means comprising a support part (8) fixing the cassette (5) with the x-ray film (6) securely in place on the patient's mouth.

4,193,003
METHOD FOR CONTROLLING THE MIGRATION OF A CHEMICAL SPECIES WITHIN A SOLID SUBSTRATE

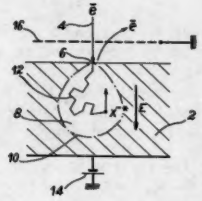
Bruno Blanchard, Grenoble; Claude Legressus, Fontenay le Fleury; Daniel Massignon, Paris; Rene Sopizet, Chevilly la Rue, and René Stefani, Meylan, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 11, 1978, Ser. No. 895,382

Claims priority, application France, Apr. 18, 1977, 11569

Int. Cl.[2] H01J *37/06*

U.S. Cl. 250—492 A **16 Claims**



1. A method for controlling the migration of an electronegative chemical species within a solid substrate which exhibits ionic conduction, wherein said method comprises irradiating said substrate with electrons which have sufficient energy to penetrate into said substrate and produce therein metastable excited negative ions of said species and applying to said substrate an electric field having a direction opposite to the desired direction of migration.

4,193,004
FLUID LEVEL MONITORING THROUGH FLUID CELL PROTRUSION

Donn D. Lobdell, Golden; Stephen J. Herman, Evergreen; Robert L. Anderson, Boulder, and Thomas E. Goyne, Denver, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 22, 1978, Ser. No. 917,850

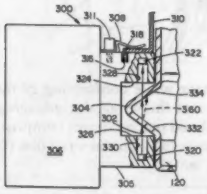
Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—577 **17 Claims**

1. Apparatus for monitoring the level of a liquid in a reservoir, comprising:

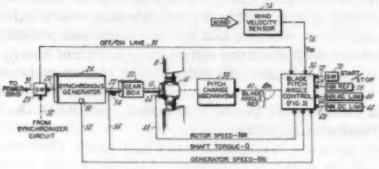
an integrally-formed transparent monitoring portion of said reservoir, said monitoring portion including

a first transparent wall portion and
a second transparent wall portion,
a light source positioned outside of said reservoir for directing a beam of light toward said first wall portion along a first linear path,
said first linear path passing through said wall portions and defining a monitoring line segment as that portion of said first linear path inside said wall portions,
said monitoring line segment being a small fraction of the largest interior dimension of a monitoring cross section taken through said reservoir along a plane defined by said first linear path and an intersecting line normal to said first transparent wall portion, and



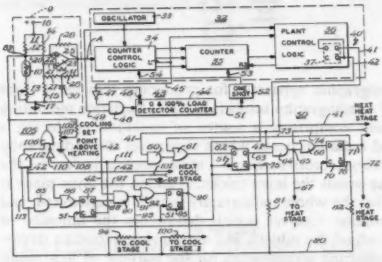
a light sensor positioned outside said reservoir and directed at said second transparent wall portion along a second linear path,
said second linear path being the path said beam of light takes upon exiting from said second wall portion when said monitoring portion is not occupied by liquid,
said first and second wall portions being adapted when said monitoring portion is occupied by liquid to cause said beam of light transmitted by said source to be refracted within said monitoring portion and to emerge from said second wall portion along a third linear path not striking said sensor.

4,193,005
MULTI-MODE CONTROL SYSTEM FOR WIND TURBINES
Joseph M. Kos, Holyoke, Mass.; John P. Patrick, South Windsor, and Kermit I. Harner, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Aug. 17, 1978, Ser. No. 934,658
Int. Cl.[2] F03D *9/00*
U.S. Cl. 290—44 **18 Claims**



1. In a power generating system including a wind turbine driven generator adapted to be selectively connected to a load to supply power thereto, said wind turbine having a wind driven rotor with a plurality of variable pitch angle blades, a control for adjusting the pitch angle of said blades comprising:
speed control means adapted to produce a first signal indicative of rate of change of blade pitch angle when said generator is not supplying power to said load,
acceleration control means adapted to produce a second signal indicative of rate of change of blade pitch angle during start up of said wind turbine,
deceleration control means adapted to produce a third signal indicative of rate of change of blade pitch angle during shut down of said wind turbine,
power control means adapted to produce a fourth signal indicative of rate of change of blade pitch angle when said generator is supplying power to said load,
means for selecting one of said blade pitch angle rate signals,
integrator means receiving said selected blade pitch angle rate signal and producing therefrom a desired blade pitch angle signal,
and actuator means receiving said desired blade pitch angle signal and controlling the pitch angle of said blades in response thereto.

4,193,006
MULTI-STAGE CONTROLLER
John L. Kabat, Bloomington, and Arlon D. Kompelien, Richfield, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 11, 1978, Ser. No. 941,441
Int. Cl.[2] G05D *23/24;* **H05B** *1/02;* **G05B** *11/16*
U.S. Cl. 307—117 **13 Claims**



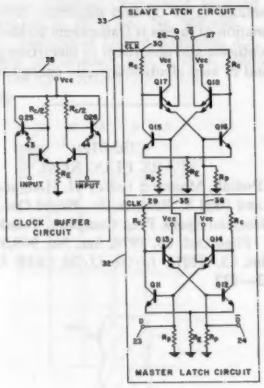
1. A condition control system, including: condition responsive time proportional control means having switched output means; said switched output means providing repetitively switched output signals at a rate representative of a time constant of said time proportional control means when said condition responsive means senses a condition which is within a selected range; said switched output means providing constant output signals when said condition is outside of said selected range; counting means having input means responsive to said switched output signals; said counting means including pulse generating means; said pulse generating means having output means connected to said counting means and providing signals thereto; said counting means combining said condition responsive repetitively switched output signals and said pulse generating output signals to expand a time constant of said condition responsive time proportional control means at an output means of said counting means; count detection means connected to said counting means; said count detection means including second counting means which counts when said first counting means is not counting, and which is reset when said first counting means is counting; said count detection means including output means having an output pulse when said second counting means counts to its capacity; condition control operating means connected to said count detection means output means to receive said output pulse and further being connected to said first counting means output means; said two counting means outputs arranged to operate said condition control operating means; said condition control operating means further including feedback circuit means to said condition responsive time proportional means; and said feedback means altering an input of said condition responsive control means when said condition control operating means is operated by the outputs from said first counting means and said count detection means.

4,193,007

EMITTER COUPLED LOGIC MASTER-SLAVE FLIP-FLOP WITH EMITTER-FOLLOWER CLOCK ENTRY

Gary W. Tietz, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 12, 1978, Ser. No. 914,524
Int. Cl.[2] H03K 3/286
U.S. Cl. 307—291 1 Claim



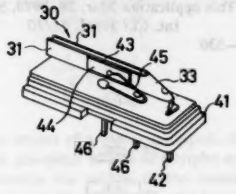
1. A master-slave flip-flop, comprising
first and second complementary data input terminals for receiving complementary data input signals;
first and second complementary output terminals;
first and second complementary clock input terminals for receiving complementary clock input signals;
a master latch circuit, including
a differential pair of first and second single-emitter bipolar transistors having their bases respectively coupled to the first and second complementary data input terminals, and their collectors coupled to the first clock input terminal; and
a pair of first and second dual-emitter bipolar emitter-follower transistors having their bases respectively coupled to the collectors of the first and second single-emitter transistors, and their first emitters respectively cross-coupled to the bases of the second and first single emitter transistors; and
a slave latch circuit, including
a pair of third and fourth single-emitter bipolar transistors having their bases respectively coupled to the second emitters of the first and second dual-emitter transistors, and their collectors coupled to the second clock input terminal; and
a pair of third and fourth dual-emitter bipolar emitter-follower transistors having their bases respectively coupled to the collectors of the third and fourth single-emitter transistors, their first emitters respectively cross-coupled to the bases of the fourth and third single-emitter transistors, and their second emitters respectively coupled to the first and second complementary output terminals.

4,193,008

TUNING FORK FORMED OF ROLLED INVARIABLE ELASTICITY MATERIAL

Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 3, 1978, Ser. No. 892,946
Claims priority, application Japan, Apr. 18, 1977, 52-49029[U]
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—321 9 Claims



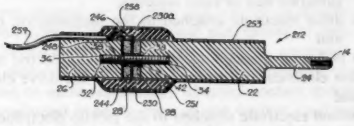
1. A tuning fork made of a folded blank of a bifurcate shape having a single linking portion and two finger portions extending from said single linking portion in bifurcate directions, said blank cut from a plate material of invariable elasticity formed through a rolling operation resulting in a residual stress in the rolling direction in said plate material, said blank being folded along a single folding line corresponding to said single linking portion of said blank along a central line at an angle between both said two finger portions of said blank, so that both said two finger portions may be folded to face each other to extend in parallel with each other, said folding line of said blank being selected to cross said rolling direction in said plate material at a given angle.

4,193,009

ULTRASONIC PIEZOELECTRIC TRANSDUCER USING A RUBBER MOUNTING

Benton A. Durley, III, Rte. 45, Druce Lake, P.O. Box 304, Grayslake, Ill. 60030

Continuation-in-part of Ser. No. 652,227, Jan. 26, 1976, abandoned, which is a division of Ser. No. 525,487, Nov. 20, 1974, abandoned. This application Nov. 7, 1977, Ser. No. 848,787
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—323 27 Claims



1. An ultrasonic transducer, comprising
an elongated front end mass,
an elongated tail mass,
a pair of piezoelectric elements disposed between said front end mass and said tail mass,
an electrode plate disposed between said piezoelectric elements,
means for clamping said front end mass and said tail mass together with said piezoelectric elements and said electrode plate clamped therebetween,
and an electrically insulating mounting member surrounding and slidably receiving said piezoelectric elements and adjacent portions of said front end mass and said tail mass in an opening in said mounting member,
said mounting member having an internal slot within said opening and slidably receiving and retaining said electrode plate,

said opening and said slot having a sufficiently loose fit with said piezoelectric elements, said masses and said electrode plate to obviate any substantial damping of ultrasonic vibrations.

4,193,010

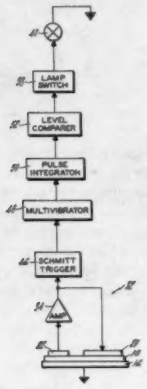
SENSOR DEVICE USING PIEZOELECTRIC COATING SUBJECTED TO BENDING

Harry W. Kompanek, Santa Barbara, Calif., assignor to Essex Transducers Corporation, Carpinteria, Calif.

Continuation-in-part of Ser. No. 749,132, Dec. 9, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,997

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—330 **6 Claims**



1. A sensor device comprising:

a base having means for attaching the device to an object;

a sandwich element supported by the base, capable of bending in response to an electrical input and capable of providing an electrical output in response to the bending, including:

an electrically conductive material which forms a substrate,

piezoelectric material, including an interbonded mixture containing phosphorous, zirconium, titanium and chromium, chemically bonded to one side of the substrate by the attachment of phosphate ions in the mixture to the substrate due to ionic bonding,

a drive electrode attached to the piezoelectric material, and

a pickup electrode attached to the piezoelectric material;

a first electrical conductor attached to the drive electrode; and

a second electrode attached to the pickup electrode.

4,193,011

THIN ANTIREFLECTION COATING FOR ELECTRO-OPTICAL DEVICE

Herbert K. Pollehn, Alexandria, and Jerry L. Bratton, Woodbridge, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

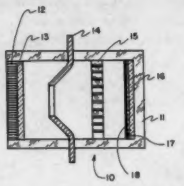
Filed May 17, 1978, Ser. No. 906,711

Int. Cl.[2] H01J *29/28, 1/70*

U.S. Cl. 313—94 **10 Claims**

1. An electro-optical device having at least a photocathode capable of producing an electron image from an electromagnetic energy image in a band impinging thereon, and having a phosphor screen juxtaposed to said photocathode and with an aluminum layer on the side of the screen toward said photocathode, whereby an electron image on said photocathode is focussed through said aluminum layer onto said screen to induce a photoimage thereon, the improvement comprising:

a thin dielectric layer on said aluminum layer; and



a thin metalfic layer on said dielectric layer, whereby the combination of layers is transparent to electrons from said photocathode and absorbent to electromagnetic energy in the band of said electromagnetic energy image.

4,193,012

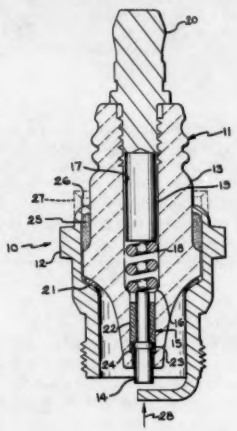
SPARK PLUG SEAL

Richard S. Podiak, Maumee; LeRoy H. Houghton, Toledo, both of Ohio, and Paul E. Rempes, Jr., Royal Oak, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 10, 1978, Ser. No. 949,572

Int. Cl.[2] H01T *13/00, 13/20;* **C04B** *35/20*

U.S. Cl. 313—137 **3 Claims**



1. A spark plug sealing material consisting essentially of a mixture of from about 15 to 30 percent of silicon metal with from about 85 to 70 percent of talc.

4,193,013

CATHODE FOR AN ELECTRON SOURCE AND A METHOD OF PRODUCING THE SAME

Masaaki Futamoto, Tsukui; Ushio Kawabe, Hamuramachi; Shigeyuki Hosoki, Hachioji; Tsutomu Komoda, Hinodemachi, and Shigehiko Yamamoto, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 18, 1978, Ser. No. 897,406

Claims priority, application Japan, Apr. 18, 1977, 52-43548

Int. Cl.[2] H01J *1/15, 9/18*

U.S. Cl. 313—341 **14 Claims**

1. In a cathode having an emitter tip made of an electron emissive material, a filament for holding the emitter tip, and a

binder for bonding the emitter tip and the filament, a cathode characterized in that said filament is made of glassy carbon and

said binder is made of glassy carbon containing at least one of carbide powder and boride powder.

4,193,014

DISPLAY ARRANGEMENTS

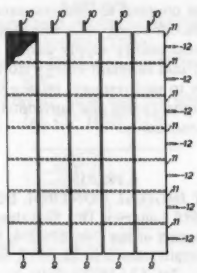
Ralph D. Nixon, Braintree, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Jun. 9, 1977, Ser. No. 805,035

Claims priority, application United Kingdom, Jul. 10, 1976, 28793/76; Fed. Rep. of Germany, Sep. 9, 1976, 2640632

Int. Cl.[2] H01J *31/66, 29/80*

U.S. Cl. 313—396 **5 Claims**



1. A display arrangement comprising a cathode ray tube, said cathode ray tube including an electron flood gun comprising a cathode, an anode and an accelerating grid disposed between said cathode and said anode whereby said flood gun emits a wide solid cone of electrons, a fluorescent screen and an electrode for controlling the passage of electrons from the electron flood gun to the fluorescent screen, two adjacent and superposed segmented mesh electrodes mounted adjacent to said fluorescent screen, each segmented mesh electrode comprising a set of adjacent parallel co-planar open mesh stripes electrically insulated from each other, each stripe being individually addressable and the open mesh of each stripe presenting a pattern of interstices which are closely spaced both transversely across and longitudinally along each such stripe to permit electrons to pass through the interstices with little physical interruption, and the stripes of one segmented mesh electrode being in crossing relationship to the stripes of the other segmented mesh electrode, whereby an addressed stripe of said one electrode and an addressed stripe of said other electrode in combination control the passage of electrons through said two segmented mesh electrodes onto said screen at and throughout a region of their common crossing.

4,193,015

COLOR TELEVISION DISPLAY TUBE

Piet G. J. Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

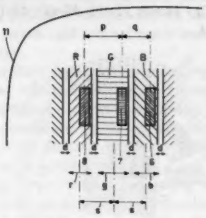
Filed Aug. 18, 1978, Ser. No. 935,030

Claims priority, application Netherlands, Sep. 1, 1977, 7709617

Int. Cl.[2] H01J *29/07, 29/32, 31/20*

U.S. Cl. 313—408 **2 Claims**

1. A colour television display tube comprising, in an evacuated envelope, a display screen having a plurality of triplets of parallel phosphor stripes spaced from each other and each luminescing in one of three different colors when struck by electrons, means for generating three electron beams directed onto said screen and a shadow mask having a plurality of apertures for assigning each beam to phosphor stripes of one color so that said beams impinge on said screen and form three spaced electron spots each on a respective one of said phosphor stripes, wherein the distances between the centers of



adjacent phosphor stripes of a triplet are equal, the widths of the two outermost phosphor stripes of a triplet are equal and the difference between the widths of the central phosphor stripe and an outermost phosphor stripe of a triplet is equal to the difference of the center-to-center distances between the central electron spot and the two outermost electron spots which cause the triplet to luminesce.

4,193,016

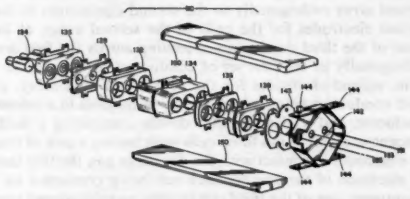
ELECTRON GUN SHIELD CUP PROVIDING TUBE EVACUATION BYPASS VENTS

H. Rudolf Zeidler, Highland Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 4, 1977, Ser. No. 839,461

Int. Cl.[2] H01J *1/96*

U.S. Cl. 313—449 **4 Claims**



1. In a television picture tube having a bulb with a neck at the rear end thereof, an electron gun located in closely confined relationship in said neck, said gun having at least one cathode having an electron-emissive coating, apertured substantially diamond-shaped shield cup with truncated corners having one or more tangentially directed contact springs attached to selected opposite ones of said corners, said springs being located in the plane of said shield cup and being capable of being deflected in a radially inward direction, said gun further including a plurality of electrodes interspaced between said cathode and said shield cup nad having apertures in alignment with said cathode and with said apertures in said shield cup to form coaxial beam passageways, said tube being characterized by said shield cup having one or more inward formations corresponding to the flats on the said diamond shape and located adjacent to said contact springs for providing augmented deflection space for said springs and for defining one or more openings between said shield cup and the inner wall of said neck, said openings acting as vents to bypass a flow of high-velocity gas around said gun and away from said aperture to prevent said beam passageways from forming said conduits for said exhaust gas during tube evacuation whereby damage to said electron-emissive coating from said high-velocity gas is prevented.

4,193,017

GAS DISCHARGE DISPLAY PANEL

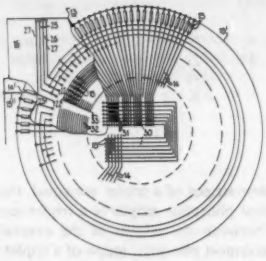
Frank Walters, Bury, England, assignor to Ferranti Limited, Hollinwood, England

Filed Jan. 16, 1979, Ser. No. 3,914

Claims priority, application United Kingdom, Jan. 18, 1978, 01929/78

Int. Cl.[2] **H05B** *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 **7 Claims**



1. A direct current gas discharge display panel comprising a block of electrically insulating material having a plurality of gas filled cells arranged in a rectangular first array surrounded by a plurality of cavities arranged in a second array of concentric circles, each of the cells of the first array having an electrode at one end thereof connected by an individual resistor to one of a set of first conductors extending along one co-ordinate of the first array and each cell of the second array having an electrode at said one end connected by an individual resistor to one of a set of concentric second conductors, a set of third conductors extending across the other ends of the cells of the second array orthogonally to the second conductors to form second electrodes for the cells of the second array, at least some of the third conductors extending across the first array orthogonally to the first set of conductors to connect to, or form, second electrodes for the cells of the first array, said third conductors being joined by way of resistors to a common conductor, and a glow transfer device comprising a further concentric circle of gas filled cells each having a pair of transfer electrodes in contact with the discharge gas, the first transfer electrode of the pair for each cell being connected to, or comprising, one of the third conductors, and the second transfer electrode being connected to other second transfer electrodes to form groups of equal numbers, corresponding electrodes in each group being connected to a transfer conductor extending concentrically of the cells such that repetitive energisation of each transfer conductor in turn causes a discharge formed in one glow transfer cell to move around the circle by the mechanism of glow transfer changing the potential of each third conductor in turn to cause striking or extinguishing of discharges in cells of the first or second array addressed contemporaneously by way of the first or second conductors respectively.

4,193,018

DEFLECTION CIRCUIT

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 20, 1978, Ser. No. 944,012

Int. Cl.[2] **H01J** *29/70*

U.S. Cl. 315—408 **15 Claims**

9. A horizontal deflection circuit, comprising:

a deflection winding;

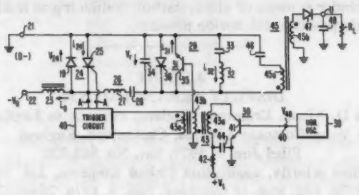
a retrace capacitor coupled to said deflection winding for forming a resonant retrace circuit;

a resonant energy storage circuit coupled to said resonant retrace circuit;

an energy supply coupled to said resonant energy storage circuit for transferring energy from said energy supply to said resonant energy storage circuit;

a horizontal output device coupled to said deflection winding;

control means coupled to a control electrode of said horizontal output device for providing a turn-off bias signal to said device for generating a resonant retrace oscillation in said resonant retrace circuit; and



switching means coupled to said resonant energy storage circuit for disconnecting said resonant energy storage circuit from said energy supply during said resonant retrace interval, said resonant energy storage circuit transferring energy to said resonant retrace circuit when said turn-off bias signal causes said horizontal output device to become nonconductive.

4,193,019

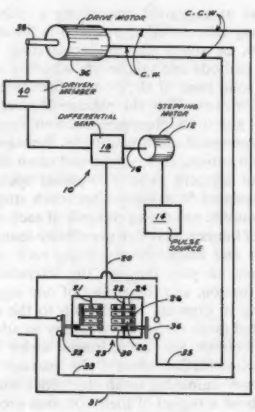
DIRECT DIGITAL CONTROL DEVICE

Henry R. Killian, 915 Longview Dr., Sugarland, Tex. 77478

Continuation-in-part of Ser. No. 574,294, May 5, 1975, abandoned. This application Sep. 29, 1977, Ser. No. 837,681

Int. Cl.[2] **H02K** *7/10*

U.S. Cl. 318—13 **11 Claims**



1. A digital control system comprising:

a differential gear device;

an incremental rotational, bi-directional input drive connected to drive said differential gear device to a selected rotary position;

a bi-directional output drive adapted to move a member to a selected position determined by the rotary position selected by the input drive;

a feedback drive means activated in response to operation of said output drive and connected to drive said differential gear device in opposition to said input drive;

first and second multi-stage progressive intermittent drive devices wherein in each said device, a complete revolu-

tion of each stage produces a partial revolution, incremental movement of the next succeeding stage;

said differential gear device being connected to drive said first and second progressive intermittent drive devices in opposite advancing and receding directions;

first and second activators, each operative when engaged to activate said output drive in one of two opposite directions; and

first and second actuating means, each on an actuating stage of one of said intermittent drives other than the first stage thereof, positioned to engage respectively said first and second activators upon a single advancing incremental movement of said actuating stage and to disengage said activator upon reversal of said incremental movement;

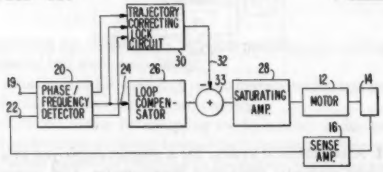
said progressive intermittent drive devices each being initially set in a null position wherein a partial revolution of said first stage thereof in an advancing direction only will produce an incremental movements of subsequent stages thereof, including said actuating stage.

4,193,020

PHASE LOCK CONTROL SYSTEM WITH TRAJECTORY CORRECTION

Hubert Song, Sunnyvale, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 22, 1978, Ser. No. 908,038
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—314 **7 Claims**



1. A phase lock control system for locking output pulses from a variable frequency pulse generator in phase with a series of reference pulses that recur at regular intervals comprising a comparator for receiving said output pulses and said reference pulses and producing a phase error signal representative of the phase difference therebetween, means responsive to said error signal for driving the variable frequency pulse generator in a sense to reduce said phase error signal, means coupled to the comparator for deriving from the phase error signal an error rate signal indicative of the rate of change of

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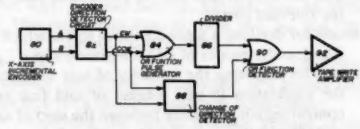
4,193,021

APPARATUS FOR GENERATING AND USING A MAGNETIC TAPE TO CONTROL MOVEMENT OF A CO-ORDINATE DRIVE TOOL CARRIAGE

Paul E. Gale, Lancaster, Ohio, and Endre L. Toth, Danbury, Conn., assignors to Arcair Company, Lancaster, Ohio

Filed Dec. 5, 1977, Ser. No. 857,169
Int. Cl.[2] G05B *19/42*
U.S. Cl. 318—568 **10 Claims**



1. In a co-ordinate drive positioning system adapted for use in oxy-fuel, laser, electron beam, plasma, water, or mechanical tool working of a metal or non-metallic workpiece the improvement comprising in combination:

a first track adapted for mounting on a pattern holding surface;

a second track movably mounted at right angles to said first track and adapted to move along said pattern holding surface at right angles to said first track;

a tracing control assembly including an optical tracing unit with integral drive means movably mounted on said second track to follow a line pattern on said pattern holding surface and move said second track and said tracing control assembly;

means on said first and second track to generate signals responsive to movement of the second track and tracing control; said signal generating means includes encoders to generate proportional pulse trains corresponding to displacement of the tracing control and second track movement relative to said pattern;

a magnetic tape recorder for generating a tape based upon said generated signals said tape recorder including means to scale said recording so that a pattern of different size than that traced by said co-ordinate drive positioning system can be utilized in generating said tape; and

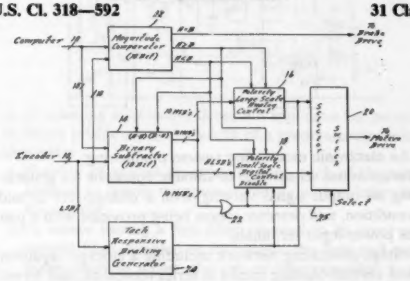
a separate co-ordinate drive positioning system having means to play back said tape and generate signals to move said co-ordinate drive positioning system along an associated workpiece in accord with the pattern used to generate said taped signals.

4,193,022

ANALOG/DIGITAL NUMERICAL CONTROL SYSTEM

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Mar. 22, 1978, Ser. No. 889,069
Int. Cl.[2] G05B *11/18*
U.S. Cl. 318—592 **31 Claims**



1. In a closed-loop numerical control system for controlling the movement of a machine assembly including motive drive means, computing means for producing a digital output signal indicative of the desired position of said machine assembly, and encoder means for producing a digital output signal indicative of the actual position of said machine assembly; control circuit means for controlling said motive drive means comprising:

subtractor means responsive to said digital output signals for digitally determining the difference between said desired position and said actual position and producing a digital difference signal in accordance therewith:

analog control means for producing a first control signal in accordance with a predetermined number of the most significant bits in said difference signal that is used to control said motive drive means for large scale differences between said desired position and said actual position;

digital control means for producing a second control signal in accordance with a predetermined number of the least significant bits in said difference signal that is used to control said motive drive means for small scale differences between said desired position and said actual position, said digital control means including a voltage divider network comprising a plurality of parallel connected resistance

elements each associated with one of said predetermined number of least significant bits; and

selector means for transferring the control of said motive drive means from said analog control means to said digital control means when the value of said difference signal falls below a preselected value.

4,193,023

ELECTRONIC MONITORING SYSTEM WITH LOW ENERGY CONSUMPTION IN QUIESCENT STATE

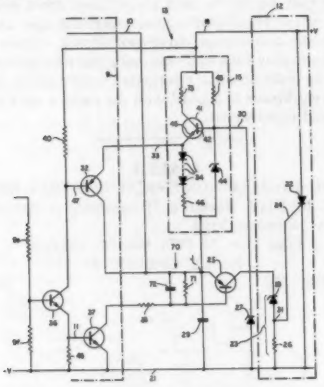
Robert Buck, Kirchbuhlweg 128, Neukirch, Fed. Rep. of Germany (7995), and Gerd Marhofer, Beckmannsbusch 67, Essen-Bredeney, Fed. Rep. of Germany (4300)

Filed Mar. 17, 1978, Ser. No. 887,832

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711877

Int. Cl.[2] H01H *36/00*

U.S. Cl. 323—19 **10 Claims**



1. An electronic monitoring system comprising:

detector means sensitive to an ambient condition for generating an output signal varying with a changeover in said condition, said detector means being provided with a pair of power-input terminals;

a voltage-generating network including a storage capacitor and current-limiting means in series therewith, said terminals being connected across said storage capacitor in an energizing circuit for said detector means;

a source of direct current with a pair of supply leads connected across said network for charging said storage capacitor via said current-limiting means, one of said supply leads having an extension included in said energizing circuit;

a current-responsive load in series with said source and said network;

a binary electronic control device connected in parallel with said network and provided with an operating circuit connected across said storage capacitor, said operating circuit including normally nonconductive electronic switch means between said storage capacitor and an input electrode of said control device for maintaining the latter in a high-impedance state prior to occurrence of said changeover, said electronic switch means comprising a Zener diode forming part of a voltage divider included in said operating circuit, said input electrode being connected to a tap on said voltage divider; and

trigger means responsive to said output signal operatively connected to said electronic switch means for rendering same conductive upon the occurrence of said changeover, thereby converting said control device to a low-impedance state short-circuiting said network.

4,193,024

PULSED NUCLEAR MAGNETIC RESONANCE SPECTROMETERS

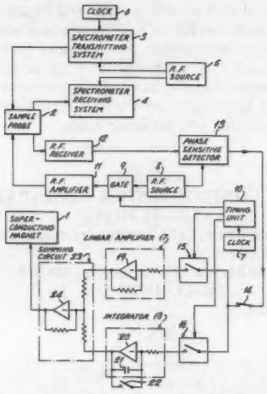
David I. Hoult, Silver Spring, Md., and Peter Styles, Oxford, England, assignors to National Research Development Corporation, London, England

Filed Jul. 13, 1978, Ser. No. 924,437

Claims priority, application United Kingdom, Feb. 15, 1978, 06007/78

Int. Cl.[2] G01R *33/08*

U.S. Cl. 324—313 **1 Claim**



1. A stabilisation system for a magnet employed in a pulsed nuclear magnetic resonance spectrometer, said system comprising:

means for exciting magnetic resonance of a given nuclear species in a reference sample subjected to the magnetic field generated by said magnet, by irradiating said sample with pulses of radio frequency energy spaced apart by intervals substantially greater than the time constant for free induction decay of said magnetic resonance;

means for receiving resonance signals emanating from said sample during said intervals as a result of the excitation of said magnetic resonance;

a detection system for effecting phase-sensitive detection of said resonance signals with reference to said radio frequency energy;

means for deriving a first control signal which is proportional to the output of said detection system;

means for causing said deriving means to be operative only during periods which immediately follow said pulses and have a duration approximately equal to said time constant;

an integrator;

means for applying the output of said detection system to said integrator only during a portion of each of said periods, the start of said portion being later than the start of the relevant period;

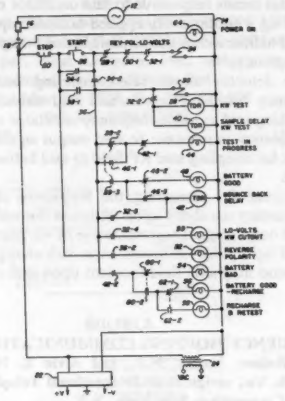
means for deriving a second control signal which is proportional to the output of said integrator; and

means for adjusting the intensity of said magnetic field by the application to said magnet of said first and second control signals, the delay between the start of each of said periods and the start of said portion of that period being sufficiently long to ensure that during said delay the adjustment of said magnetic field by virtue of the application of said first control signal will bring about effective locking of the frequency of said resonance signals to the frequency of said radio frequency energy.

4,193,025
AUTOMATIC BATTERY ANALYZER

Charles E. Frailing, Milwaukee, and Thomas J. Dougherty, Waukesha, both of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Dec. 23, 1977, Ser. No. 863,925
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—427 19 Claims



1. Apparatus for determining the acceptability of a storage battery under test and comprising:

first circuit means for coupling to the battery under test and performing a load test on said battery;

second circuit means for coupling to the battery under test and performing a voltage bounce back test on said battery;

third circuit means for coupling to the battery under test and performing a test of an internal circuit parameter of said battery; and

fourth circuit means coupled to said first, second, and third circuit means for controlling the sequence in which the tests of said first, second, and third circuit means are performed and providing a readout responsive to outputs of said first, second, and third testing means.

4,193,026
METHOD AND APPARATUS FOR MEASURING THE STATE OF CHARGE OF A BATTERY BY MONITORING REDUCTIONS IN VOLTAGE

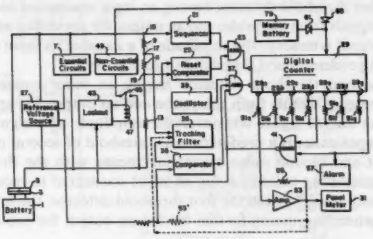
Eugene P. Finger, Brewster, and Eugene A. Sands, Scarsdale, both of N.Y., assignors to Curtis Instruments, Inc., Mount Kisco, N.Y.

Continuation of Ser. No. 678,128, Apr. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,055, Jun. 27, 1975, Pat. No. 4,017,724, and Ser. No. 538,463, Jun. 14, 1975, abandoned. This application Aug. 25, 1978, Ser. No. 936,725
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—428 129 Claims

1. Apparatus for monitoring the condition of a battery during its discharge from a charged condition comprising:

means for monitoring the output terminal voltage of the battery and producing an intermediate output signal for at least some instances when the magnitude of the terminal voltage falls below a threshold value during said discharge;

means for integrating said intermediate output signal over a plurality of reductions in the magnitude of the terminal voltage which produce an intermediate output signal; and

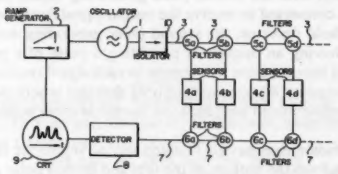


means for producing a first output signal related to the integral formed by said integrating means.

4,193,027
MICROWAVE MOISTURE-PROFILE GAUGE

Walter Wyslouzil, Carlsbad Springs, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 2, 1978, Ser. No. 947,889
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 R 3 Claims



1. A scanning microwave detection apparatus for providing a moisture profile along the width of a predetermined sample, comprising:

a plurality of spaced moisture sensors, each of the sensors adapted to couple microwave energy with a finite area of the sample;

each sensor having a first filter coupled to its input and a second filter coupled to its output, the first and second filters forming a pair, the pair of filters coupled to each sensor being tuned to the same frequency and each of the pairs of filters being tuned to a different predetermined frequency within a selected frequency band thereby having a substantially non-overlapping frequency band-pass;

microwave source controlled to sweep through the frequencies within the selected frequency band, said source being coupled to the input filters; and

detector means coupled to the output filters for sequentially detecting energy outputs of the sensors which are a function of the moisture content of the sample.

4,193,028
EDDY CURRENT INSTRUMENTATION CIRCUITRY FOR DISTINGUISHING FLAW SIGNALS FROM SPURIOUS NOISE SIGNALS

Byron E. Downs, II, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 5, 1978, Ser. No. 903,268
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—237 7 Claims

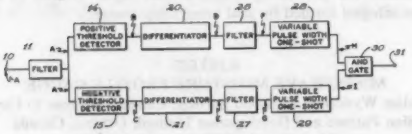
1. In an apparatus for eddy current non-destructive testing of materials wherein means are provided for obtaining relative motion between the material and a probe capable of detecting a flaw in such material and in response to each such flaw generating an electrical output signal having a characteristic

frequency and both first and second polarity excursions, means for improving apparatus signal detection sensitivity and its ability to reliably distinguish signals representing material flaws from spurious noise signals, the means comprising:

a first threshold detector having an input connected to receive signals from the probe and an output for providing an output signal whenever the amplitude of a signal at its input exceeds a predetermined threshold of first polarity;

a second threshold detector having an input connected to receive signals from the probe and an output for providing an output signal whenever the amplitude of a signal at its input exceeds a predetermined threshold of second polarity;

first and second pulse generating means with the first pulse generating means having an input connected to receive the output signal from the first threshold detector, the first pulse generating means further having an output for providing a



pulse of a predetermined time duration in response to each signal received from the output of the first threshold detector, and with the second pulse generating means having an input connected to receive the output signal from the second threshold detector, the second pulse generating means further having an output for providing a pulse of a predetermined time duration in response to each signal received from the output of the second threshold detector where the pulses of predetermined time duration coexist at some point in time; and

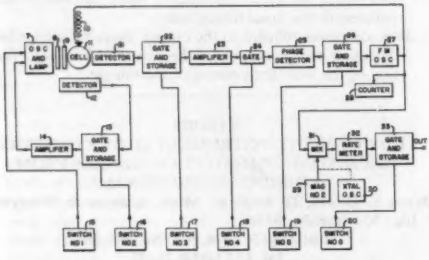
comparison means having first and second inputs for receiving pulses from the outputs of the first and second pulse generating means respectively, the comparison means further having an output for providing a signal whenever pulses appear simultaneously at both of its inputs, the signal at the output of the comparison means being representative of a flaw in the material under test.

4,193,029

PULSED HELIUM MAGNETOMETER

Armand Cioccio, Silver Spring, and Walter C. Folz, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1963, Ser. No. 262,810
Int. Cl.[2] H01S *1/06*
U.S. Cl. 324—301 **9 Claims**



1. A pulsed helium magnetometer comprising;

a cell containing metastable helium adapted to be placed in a magnetic field to be measured,

means including a helium lamp for optically pumping said metastable helium to produce atomic alignment of the helium atoms capable of undergoing magnetic resonance at a frequency dependent on said magnetic field,

means for pulsing said lamp to transmit high intensity light pulses to said cell,

detection means connected to receive light pulses radiated by said cell and to provide an output signal representative of variations in intensity of said radiated pulses,

variable frequency oscillator means for receiving said output signal means responsive to said oscillator means for establishing a continuously applied noninterrupted RF field to said helium atoms substantially at said magnetic resonance frequency,

phase detector means interconnecting said variable frequency oscillator means and said detection means for locking said variable frequency oscillator to said resonant frequency in response to said output signal,

means for coupling said RF field to said helium atoms in said cell,

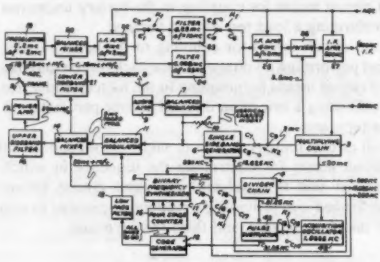
and means for measuring the frequency of said variable frequency oscillator upon variation thereof in response to said output signal representative of variations in said radiated light pulses in accordance with changes in the background magnetic field incident upon said cell.

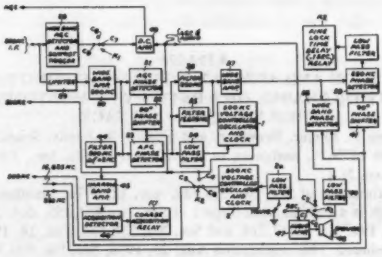
4,193,030

FREQUENCY HOPPING COMMUNICATION SYSTEM

Gerald Rabow, Nutley, N.J., and Alvin E. Nashman, Falls Church, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 1, 1968, Ser. No. 749,338
Int. Cl.[2] H04K *1/00*
U.S. Cl. 375—2 **10 Claims**





1. A communication system comprising:

first means to generate a selected code signal;

second means coupled to said first means to produce a first signal having a phase selected according to the code condition of said selected code signal;

third means coupled to said first means to produce a second signal having a frequency that hops to different ones of a plurality of discrete frequencies as determined by said selected code signal; and

a first intelligence signal coupled to one of said second and

third means to modulate one of said first and second signals;

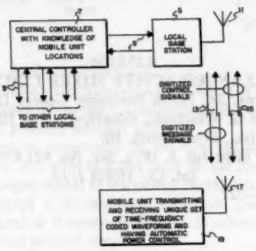
said second and third means being interconnected to provide a first propagation signal modulated by said first intelligence signal having a frequency hopping characteristic and a selected phase in each frequency hop interval.

4,193,031

METHOD OF SIGNAL TRANSMISSION AND RECEPTION UTILIZING WIDEBAND SIGNALS

George R. Cooper, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 13, 1978, Ser. No. 886,100
Int. Cl.[2] H04J *7/00*
U.S. Cl. 455—38 **11 Claims**


CENTRAL CONTROLLER WITH KNOWLEDGE OF MOBILE UNIT LOCATIONS
LOCAL BASE STATION
TO OTHER LOCAL BASE STATIONS
DIGITIZED CONTROL SIGNALS
DIGITIZED MESSAGE SIGNALS
MOBILE UNIT TRANSMITTING AND RECEIVING UNIQUE SET OF TIME-FREQUENCY CODED WAVEFORMS AND HAVING AUTOMATIC POWER CONTROL

1. A method for communication utilizing radiation of electromagnetic energy, said method comprising:

assigning a predetermined different set of time-frequency coded waveforms within a predetermined frequency spectrum to each of a plurality of users, each said set having pulses containing a multiplicity of frequencies with coding including changing the sequence of frequency occurrence;

transmitting electromagnetic energy in said predetermined frequency spectrum with said transmitted electromagnetic energy including a predetermined set of time-frequency coded waveforms for communication by and with the assigned user of said set of time-frequency coded waveforms; and

receiving transmitted electromagnetic energy that includes said set of time-frequency coded waveforms by and from the assigned user of said set of time-frequency coded waveforms whereby the user assigned said set of time-frequency coded waveforms can effect communication regardless of other users in the same frequency spectrum.

4,193,032

HIGH SPEED TRANSMITTER PULSER

Walter E. Milberger, Serverna Park, and Larry G. Wright, Pasadena, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

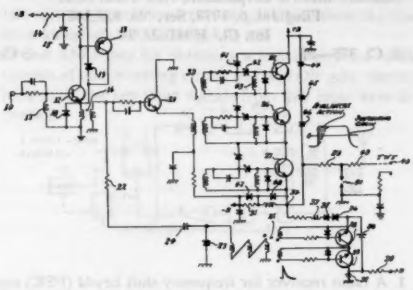
Filed May 8, 1969, Ser. No. 826,057
Int. Cl.[2] G01S *7/38*
U.S. Cl. 178—116 **6 Claims**

1. In a high speed microwave transmitter apparatus having pulser delay times in the nanosecond range, a high speed pulser apparatus comprising in combination:

a compound emitter follower means having an input and output, said compound emitter follower means receiving at said input a low level positive pulse input signal and providing at said output a signal having a leading edge,

an avalanche control means normally biased at its first avalanche level, and upon receiving said outupt signal leading edge, providing a controlled second avalanche level,

a traveling wave tube transmission means having a control grid, said controlled second avalanche level providing a bias signal which is applied to said control grid of said traveling wave tube transmission means, said bias signal turning on said transmitter traveling wave tube, and



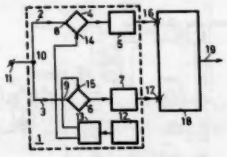
a sustaining chain means also receiving said output signal and providing a sustaining control voltage to said control grid of said traveling wave tube transmission means for the duration of said output signal.

4,193,033

QUADRATURE TRANSPOSITION STAGE

Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,918
Claims priority, application Netherlands, May 20, 1977, 7705552
Int. Cl.[2] H04L *27/14*
U.S. Cl. 375—88 **4 Claims**



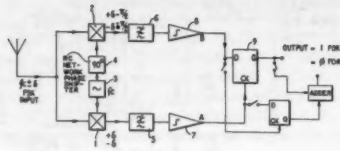
1. A quadrature transposition stage comprising first and second signal paths, each path having a modulator, a filter coupled to said modulator, said filter including at least a first resonant circuit and an output; an input means for coupling a first input of each of the modulators to a common input, a local oscillator means for producing an output signal, means for applying the output signal of said local oscillator with a selected phase to a second input of each of the modulators so that the output signal of the filter in the first signal path is in quadrature with the output signal of the filter in the second signal path, and an output circuit coupling the output of each of the filters to a common output, the resonant circuit in each of the two filters comprising an impedance element and an imaginary conductance, and first gyrator means for providing the imaginary conductances in the respective resonant circuits, said gyrator means having a first port which terminates in the impedance element belonging to the resonant circuit of one filter and a second port which terminates in the impedance element belonging to the resonant circuit of the other filter.

4,193,034

RADIO RECEIVER FOR FSK SIGNALS

Ian A. W. Vance, Newport, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 6, 1978, Ser. No. 922,245
Int. Cl.[2] H04L *27/14*
U.S. Cl. 375—88 **3 Claims**



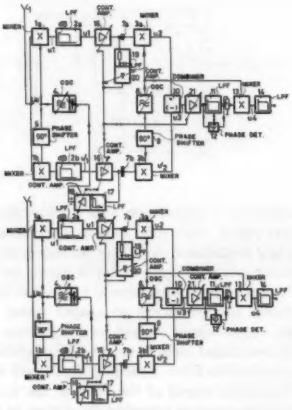
1. A radio receiver for frequency shift keyed (FSK) signals on an RF carrier comprising first and second signal paths to which the received radio signals are applied, each signal path including a mixer circuit followed by a low pass filter and a limiting amplifier stage, a local oscillator running at the carrier frequency, the local oscillator output being applied to one mixer circuit direct, means for applying the oscillator output to the other mixer circuit with 90° phase shift, and a D-type clocked flip-flop to the D input of which is applied the output of one of the limiting amplifier stages while the output of the other limiting amplifier stage is applied to the clock input of the flip-flop.

4,193,035

CIRCUIT ARRANGEMENT FOR RECEIVING ONE OF THE SIDEBANDS FROM A DOUBLE SIDEBAND SIGNAL

Hermann Berger, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,362
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657170
Int. Cl.[2] H04B *1/16, 1/68*
U.S. Cl. 455—203 **13 Claims**



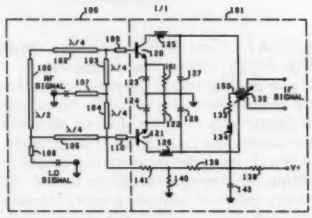
1. A circuit arrangement for receiving one of the sidebands of a double sideband signal, comprising two first mixing stages means for mixing the double sideband signal with each one of two locally produced radio frequency oscillations having the same frequency as the carrier frequency of said double sideband signal and phases shifted 90° relative to one another, first and second low pass filter means for filtering the output signals of the two mixing stages respectively, two second mixing stages means respectively coupled to said filters for mixing the filter output signals with either one of two locally produced low-frequency oscillations having the same frequency which is at least equal to the upper frequency of the baseband signal and shifted in phase 90° relative to one another, means for combining the output signals of the two second mixing stages, a third low-pass filter means coupled to said combining means for suppressing signals having a frequency above the frequency of the local low frequency oscillation, and a last mixing stage means for mixing the output signals of the third low-pass filter with one of the local low frequency oscillations.

4,193,036

BALANCED ACTIVE MIXER CIRCUIT

Frank J. Cerny, Jr., North Riverside; George D. Helm, Cary, and Ronald G. Wesoloski, Glenview, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1978, Ser. No. 921,675
Int. Cl.[2] H04B *1/16*
U.S. Cl. 455—327 **18 Claims**



1. A singly-balanced mixer circuit for developing an intermediate frequency (IF) signal for a radio transceiver operative on a plurality of radio channels, the radio transceiver having a receiving bandwidth approaching one-half of the IF frequency, said balanced mixer circuit combining a received radio frequency (RF) signal with a local oscillator (LO) signal to provide the IF signal, said mixer circuit comprising:

(a) a strip transmission line ring having a first input coupled to the RF signal and a second input coupled to the LO signal for providing first and second output signals, the first and second output signals comprised of substantially equal components of the LO signal and RF signal, the equal components of the LO signal phase shifted by 180° with respect to one another and the equal components of the RF signal in phase with each other; and

(b) an active singly-balanced mixer including:

(i) first and second active devices coupled to the first and second output signals of the transmission line ring for providing first and second mixer signals, respectively;

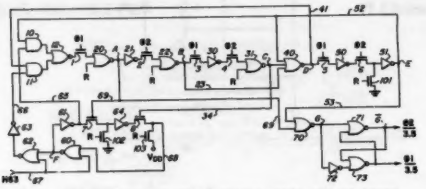
(ii) an output transformer having a tap at a predetermined location on the primary winding that is not bypassed at the RF and IF frequencies, the first and second mixer signals from the first and second active devices coupled to opposite ends of the primary winding, IF components of the first and second mixer signals adding in phase in the primary winding, and the composite IF signal provided across the secondary winding; and

(iii) a DC biasing network coupled to the tap of the primary winding of the output transformer for applying a predetermined bias voltage to the first and second active devices.

4,193,037
FREQUENCY DIVIDER CIRCUIT WITH SELECTABLE INTEGER/NON-INTEGER DIVISION

Shikun Kyu, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 20, 1978, Ser. No. 888,441
Int. Cl.[2] H03K *21/36*
U.S. Cl. 328—46 **13 Claims**



7. A divide circuit comprising:

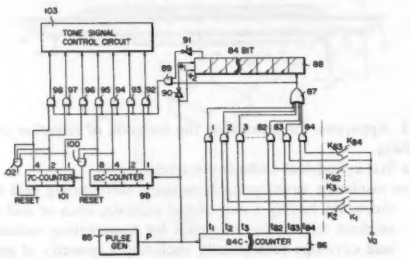
means responsive to an external clock signal of frequency N for generating an output signal of frequency N/(M+0.5), M being a positive integer; and

additional means responsive to an external control signal having first and second states, said divide circuit generating said output signal at frequency N/(M+0.5) when said control signal is in said first state and generating said output signal at frequency N/(M+1) when said control signal in said second state.

4,193,038
KEY INPUT APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,177
Claims priority, application Japan, Apr. 11, 1977, 52/41100
Int. Cl.[2] G10H *1/00*; H03K *19/24*
U.S. Cl. 328—104 **1 Claim**



1. A key input apparatus comprising:

a plurality of input keys which are manually operated;

a group of first AND gates corresponding in number to said input keys, each of said first AND gates having first and second input terminals;

first connecting means for connecting the respective output terminal of said input keys corresponding to the first input terminals of said first AND circuits;

a timing signal generating circuit which has output terminals corresponding to the number of said AND gates and produces successively different timing signals for successively scanning said first AND gates;

second connecting means for connecting the output terminals with the corresponding second input terminals of said first AND gates;

an OR gate for logically summing the output signals from said first AND gates;

a shift register which has bits corresponding in number to said first AND gates and receives the key input signals due to key depressions via said OR gate to successively shift them toward the output side of said shift register;

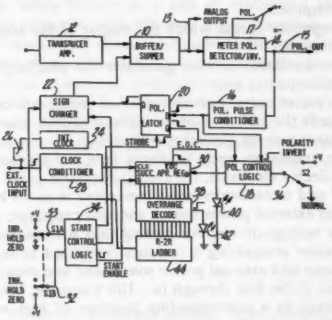
an inverting circuit which is connected to the output side of said shift register to invert an output signal from the final bit position of said shift register; and

a second AND gate for obtaining a logical product of the outputs of said inverting circuit and said OR gate, thereby producing the key input signals from said input keys depressed.

4,193,039
AUTOMATIC ZEROING SYSTEM

Richard L. Massa, Sterling Heights, and Kenneth J. Cook, Troy, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Filed Feb. 10, 1978, Ser. No. 876,918
Int. Cl.[2] H03K *13/02*
U.S. Cl. 328—162 **16 Claims**



1. Apparatus for automatically producing an analog zeroing voltage for nulling an offset voltage of either positive or negative polarity, said apparatus comprising:

polarity sensing means for sensing the polarity of a signal associated with the offset signal;

latch means coupled to the sensing means for providing a control signal whose state depends upon the polarity of the offset signal as determined by the sensing means;

voltage generator means for producing an output voltage of a magnitude substantially the same as the offset voltage;

inverter means for inverting the output voltage from the voltage generator;

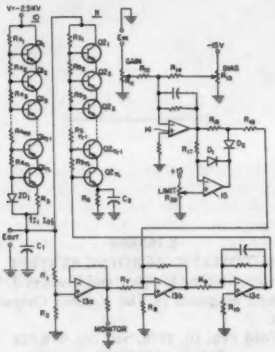
switch means having two inputs, a control input and an output, one input being coupled to the unchanged output of the voltage generator means, with the other input being coupled to the output of the inverter means, and the control input being coupled to the output of said latch means, operative to couple one of its inputs to its output depending on the state of the control signal from the latch means whereby a zeroing voltage is provided of the same magnitude yet of opposite polarity to that of the offset voltage; and

summing means coupled to the output of said switch means for summing the zeroing voltage with the offset voltage.

4,193,040
HIGH-VOLTAGE AMPLIFIER WITH LOW OUTPUT IMPEDANCE

Barry Weissman, West Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 2, 1978, Ser. No. 956,942
Int. Cl.[2] H03F *1/34, 3/04*
U.S. Cl. 330—293 **2 Claims**



1. A high-voltage amplifier for use with capacitive loads, which comprises:

(a) a capacitor across which the output of the amplifier is developed;

(b) a controllable current generator for discharging said capacitor;

(c) a constant current generator for charging said capacitor towards the potential of an external power source, said constant current generator comprising:

(1) n transistors each having a base, an emitter and a collector electrode, the collector-emitter paths of each of said n transistors being connected in series between said external power source and said capacitor;

(2) a voltage-divider for biasing said n transistors, said divider comprising n resistors connected in series between said external power source and said capacitor, to base of the first through (n−1)th transistor, being connected to a corresponding juncture of two adjacent resistors in said voltage divider

(3) a current limiting resistor connected between the emitter of said nth transistor and said capacitor; and

(4) a reverse-biased Zener diode connected between the base of said nth transistor and said capacitor; and

(d) means, responsive to the input signal to be amplified, for altering the rate at which said controllable current generator discharges said capacitor.

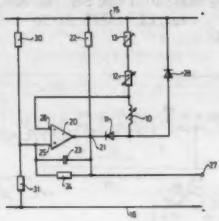
4,193,041
CONDITION RESPONSIVE INDUCTANCE TO FREQUENCY CONVERTER WITH TEMPERATURE COMPENSATION

Ernst-Olav Pagel, Böhmfeld, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,611
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726894
Int. Cl.[2] G01L *9/10*; H03K *3/02*
U.S. Cl. 331—65 **8 Claims**

1. A circuit arrangement for converting an inductance value into a specific frequency especially for producing a pressure-dependent frequency for injection systems in internal combustion engines, comprising:

a comparator, a series circuit including at least one coil with a variable inductance, a diode, and a temperature-dependent resistor coupled between the output of said comparator and a positive current supply line, the end of the coil on the side opposite the comparator output being connected to a first input to the comparator and the second



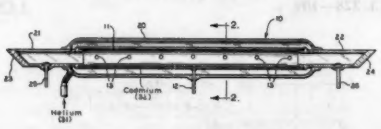
input to the comparator being connected to a source of positive potential, and

a freewheeling diode connected between the output of the comparator and the positive current supply line and bridging the coil.

4,193,042
SELF-CONFINED HOLLOW CATHODE LASER

Shing C. Wang, Temple City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1976, Ser. No. 701,474
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—945 PE **9 Claims**



1. Apparatus for promoting the emission of radiation comprising:

a first cylindrical cathode electrode;

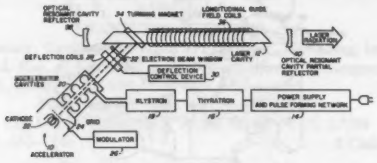
an insulating envelope, substantially surrounding said first electrode, having a pair of end sections, each of said end sections terminating in means for transmitting radiation; said envelope substantially enclosing a quantity of material, said material, at standard temperature and pressure conditions, including both a host material and a doping material, said doping material being cadmium and said host material being helium; and

combination excitation and cataphoretic means, disposed in advance of said radiation transmission means at each of said end sections, for promoting passage of electrical energy to said first electrode to cause at least some of said material to be raised from an initial state to an excited state and to further urge said some of said material away from the nearest of said radiation transmission means, said combination excitation and cataphoretic means including anode electrode means having no more than two second electrodes, one of said second electrodes being disposed along one of said end sections in advance of one of said radiation transmission means, and the other of said second electrodes being disposed along the other of said end sections in advance of the other of said radiation transmission means.

4,193,043
MICROWAVE ACCELERATOR E-BEAM PUMPED LASER

Charles A. Brau; William E. Stein, and Stephen D. Rockwood, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1977, Ser. No. 832,489
Int. Cl.[2] H01S 3/09
U.S. Cl. 331—94.5 PE 27 Claims

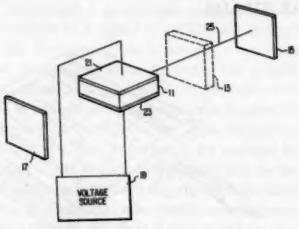


1. A device for pumping gaseous lasers comprising:
microwave linear accelerator means for generating a relativistic electron beam having energy sufficient to ionize and excite a gaseous laser medium;
means for modulating said accelerator means to produce a modulated relativistic electron beam; and,
means for applying said modulated relativistic electron beam to said laser medium.

4,193,044
RARE EARTH SEMICONDUCTOR LASER

Clyde A. Morrison, Wheaton; Nick Karayianis, and Donald E. Wortman, both of Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1978, Ser. No. 872,516
Int. Cl.[2] H01S 3/18
U.S. Cl. 331—94.5 F 9 Claims

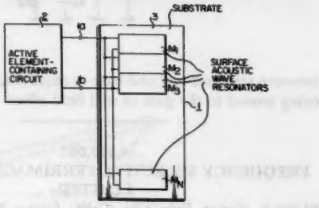


1. A solid state laser device comprising:
a semiconductor material constituting a single crystal containing optically active ions with given energy levels; said semiconductor material having the formula Ln_2TX_5, where Ln is a rare earth element, T is zirconium or hafnium, and X is sulfur or selenium;
regeneration means exhibiting high reflectance at given wavelengths optically coupled to opposite end portions of the crystal for stimulating coherent emission of light from the crystal; and
electrical pumping means coupled to the crystal for effecting an inverted population state of the optically active ions between certain ones of the given energy levels by impact excitation,
whereby stimulated emission is emitted from the crystal at a frequency corresponding to the energy difference between the certain ones of the given energy levels and at wavelengths corresponding to the given wavelengths.

4,193,045
TEMPERATURE COMPENSATED SURFACE ACOUSTIC WAVE OSCILLATORS

Kouji Houkawa, Kodaira; Yoshiki Yamauchi, Musashino, and Shokichiro Yoshikawa, Mitaki, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,556
Claims priority, application Japan, May 25, 1977, 52-61575
Int. Cl.[2] H03B 5/32
U.S. Cl. 331—107 A 10 Claims



1. A surface acoustic wave oscillator which comprises a resonator circuit formed of a plurality of parallel-connected surface acoustic wave resonators indicating turnover temperatures on different curves denoting frequency deviations relative to ambient temperature, each said surface acoustic wave resonator being formed of a pair of interdigital electrodes which are mounted on a substrate for propagating a surface acoustic wave, and whose electrode elements are arranged alternately adjacent to each other; and an active element-containing circuit connected to the resonator circuit, wherein the plurality of surface acoustic wave resonators are so constructed that the relationship between the different frequencies of said resonators and the frequency deviations thereof and the relationship between the different turnover temperatures satisfy the following formulas:

$$f_H - f_L \leqq \Delta fa$$

$$T_{p1} < \ldots < T_{pn}$$

where
f_H: a maximum frequency among those frequencies of a plurality of resonators collectively connected to the active element-containing circuit which are produced at turnover temperatures on a temperature curve;
f_L: a minimum frequency among those of said plurality of resonators;
Δfa: allowable frequency deviation of the surface acoustic wave oscillator;
T_{p1} to T_{pn}: turnover temperatures corresponding to the respective surface acoustic wave resonators.

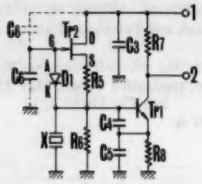
4,193,046
PIEZO-ELECTRIC OSCILLATORS WITH AUTOMATIC GAIN CONTROL

Tadataka Chiba, Tokyo, Japan, assignor to Kinsekisha Laboratory, Ltd., Tokyo, Japan

Filed Nov. 6, 1978, Ser. No. 957,951
Claims priority, application Japan, Nov. 8, 1977, 52-133997
Int. Cl.[2] H03B 3/02, 5/36
U.S. Cl. 331—109 12 Claims

1. In a piezo-electric oscillator of the type comprising a piezo-electric oscillator element, an oscillation transistor connected to control the oscillation of said oscillator element, and base bias circuit means for driving said oscillation transistor, the improvement wherein said base bias circuit means comprises a field effect transistor having a drain connected to a

power source and a gate and source connected in common to the base of said oscillation transistor, and a diode connected



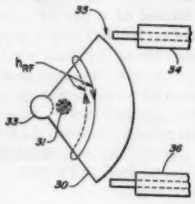
between said gate and said base to rectify the oscillation signal being passed to the gate of said field effect transistor.

4,193,047

FREQUENCY SELECTIVE FERRIMAGNETIC POWER LIMITER

Philip S. Carter, Palo Alto, Calif.; Steven N. Stitzer, Ellicott City, and Harry Goldie, Randallstown, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,130
Int. Cl.[2] H01P *1/22*
U.S. Cl. 333—17 L **1 Claim**



1. A frequency selective ferrimagnetic power limiter comprising:

a. a sectorial, radial, radio frequency transmission line resonator having an inner radius and an outer radius cooperating with a ground plane, with the included angle of the said resonant sector being from approximately 90 degrees to approximately 100 degrees;

b. a shorting post supporting the said resonant sector and grounding the said resonant sector substantially at its inner radius to the said ground plane;

c. a sphere of ferrimagnetic material positioned between the said radial resonator and the said ground plane adjacent the said inner radius;

d. means for coupling a signal into the said radial resonator;

e. means for coupling a signal out of the said radial resonator; and

f. means for providing a magnetic bias field substantially perpendicular the said radial resonator.

4,193,048

BALUN TRANSFORMER

Orville K. Nyhus, Melbourne, Fla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 22, 1978, Ser. No. 918,175
Int. Cl.[2] H01P *5/10*
U.S. Cl. 333—26 **4 Claims**

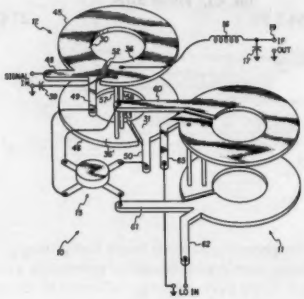
1. A balun transformer, comprising:

a printed circuit board having top and bottom surfaces,

a pair of similarly configured electrical conductors, each having first and second ends,

each of said conductors being arranged with its first end adjacent its second end,

said pair of conductors also being carried by and aligned on opposite sides of said printed circuit board with the first end of one conductor opposite the first end of the other conductor to facilitate interconnection thereof through said printed circuit board,



and means extending through said printed circuit board electrically interconnecting the first ends of said conductors,

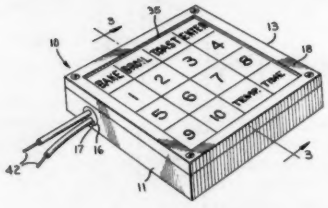
said balun transformer providing an unbalanced condition between one of said first ends of said conductors and a second end of one of said conductors, and a balanced connection between the second ends of said conductors.

4,193,049

ULTRASONIC TOUCH CONTROL PANEL

Robert J. Salem, Danbury, Conn., assignor to Deere & Company, Moline, Ill.

Filed Jun. 12, 1978, Ser. No. 914,526
Int. Cl.[2] G01D *21/00;* **H01P** *1/02;* **H03H** *7/30*
U.S. Cl. 333—141 **15 Claims**



1. A control device of the type subject to control by an operator including a housing and comprising:

(a) an ultrasonic waveguide provided with a plurality of indicia means on said housing representative of positions along said waveguide;

(b) an ultrasonic transducer coupled to the waveguide, the transducer being capable of providing, in response to an applied electrical pulse, an ultrasonic wave pulse which is suitable for propagation along a propagation path in the waveguide; and

(c) a plurality of selectable means for reflecting at least part of an ultrasonic wave pulse propagating along the propagation path, each of the selectable means being associated with an indicia means and located for reflecting at least a part of said propagating ultrasonic wave pulse back to the transducer from a different position along the propagation path, the transducer being capable of responding to such a

reflected ultrasonic wave pulse to provide a delayed electrical pulse;

whereby each delayed pulse occurs with a time delay, relative to an applied pulse, related to the position of a selected one of the selectable means relative to said transducer.

4,193,050

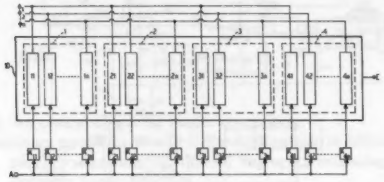
TRANSVERSAL FILTER

Karl Knauer, Gauting, and Hans J. Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,161

Int. Cl.[2] H03H *7/28;* **H03K** *5/159;* **G11C** *19/18, 27/00*

U.S. Cl. 333—165 **2 Claims**



1. A transversal filter with a charge coupled device (CCD) for realizing a filter function, comprising: a substrate comprised of doped semiconductor material having arranged on one surface thereof a series of capacitors each comprising a surface electrode and the substrate below each surface electrode as a counter electrode; each surface electrode being spaced from said surface by an insulating layer; at least three shift pulse lines supplying shift pulses displaced in phase relative to one another; said at least three shift pulse lines being respectively connected to at least first, second, and third groups of surface electrodes, a serial input means at one end of the CCD for connection to a signal to be filtered; the surface electrodes from the first group each having a non-reactive amplifying output means connected thereto; the amplifying output means also connecting to a filter output from which a filtered signal can be obtained; an amplification factor of each of said amplifying outputs corresponding to an assigned value of a pulse response of the filter function to be realized by the filter; and at least one of the surface electrodes from the second group and at least one of the surface electrodes from the third group each having an additional non-reactive amplifying output means provided therefore which is connected to the filter output.

4,193,051

MAGNETOSTRICTIVE MECHANICAL FILTER

Didier M. Beaudet, Saint-Maur-des-Fosses, France, assignor to Societe Anonyme de Telecommunications, France

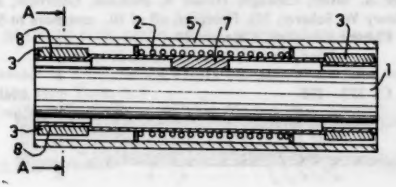
Filed May 19, 1978, Ser. No. 907,779

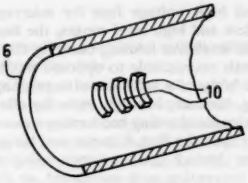
Claims priority, application France, May 26, 1977, 77 16140

Int. Cl.[2] H03H *7/10*

U.S. Cl. 333—201 **4 Claims**

1. A magnetostrictive mechanical filter comprising at least one rod of a magnetostrictive material forming a resonance element, a spool surrounding the rod, a field coil the windings of which are wound around the spool, and magnets creating a continuous magnetic field, arranged respectively at the ends of the rod, the rod being held radially in at least three points disposed regularly about the rod in the vicinity of the middle portion thereof, a rib being provided at each fixation point, said rib extending parallel to the generatrices of the rod and being





formed on the inner peripheral surface of the spool and integrally molded with said spool.

4,193,052

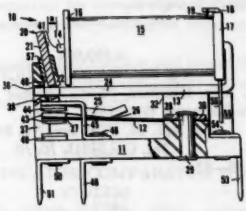
LOW CURRENT RELAY

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 20, 1978, Ser. No. 888,117

Int. Cl.[2] H01H *67/02*

U.S. Cl. 335—128 **6 Claims**



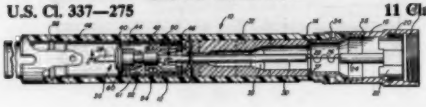
1. A relay capable of accurate assembly by automation techniques and comprising: an insulate base having laterally spaced apart abutment members rising therefrom to define therebetween an anchorage surface and equidistant and remotely therefrom a location post rising from said base and containing a core locating socket; a spring armature extending from said anchorage surface towards said post and presenting contact arm portions thereon; a magnetic flux conducting fixed core part in the form of a lower leg and an upper winding leg substantially parallel thereto said lower leg having a toe portion seatable in the socket of the locating post; means anchoring said lower core arm to said abutment of said base; a movable core part actuator pivoted on said lower arm and having a lever arm portion extending for engagement with said spring armature; and a free flange on said actuator located near an attracting face of a free end of said winding arm portion at a predetermined distance therefrom.

4,193,053

CIRCUIT INTERRUPTING DEVICE WITH ARCING ROD SPEED MODIFYING MEANS

Bruce A. Biller, Chicago; Hiram S. Jackson, Glenview, and Henry W. Scherer, Mt. Prospect, all of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Jan. 30, 1978, Ser. No. 873,626
Int. Cl.[2] H01H *85/38*
U.S. Cl. 337—275 **11 Claims**



1. An improved high voltage fuse for interrupting fault currents of both low and high level ranges, the fuse being of the type having: an insulative housing carrying thereon a pair of opposed terminals connectable to opposed points of a circuit; an elongated body of a solid arc-extinguishing material within the housing, the body having a bore therethrough of a first diameter; an elongated arcing rod having a second diameter slightly smaller than the first diameter and being movable by a spring member through said bore upon fusing of a fusible element normally preventing such movement, so that an arc, terminated on one end of the arcing rod and on a stationary terminal away from which the arcing rod moves, is elongated by such movement to interact within said arc-extinguishing material to generate arc-extinguishing gases; the diameters, the mass of the arcing rod and the rate of the spring member being so related as to efficiently extinguish low fault current, but being so related as to inefficiently extinguish the high fault current levels; wherein the improvement comprises:

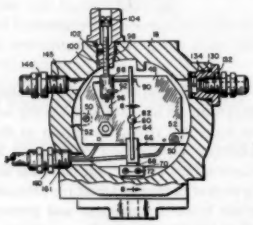
a member continuously and at all times attached to the arcing rod at a position so as to not interfere with its movement or to affect the relationship between the diameters, the member adding sufficient mass to the arcing rod so that the acceleration thereof through the bore is decreased from the acceleration the arcing rod would have without the member to render efficient the extinguishment of high fault current.

4,193,054

AIR FLOW TRANSDUCER

Robert D. Reis, Hingham, Mass., assignor to United Electric Controls Company, Watertown, Mass.

Filed Apr. 10, 1978, Ser. No. 895,261
Int. Cl.[2] H01L *10/10*
U.S. Cl. 338—42 **27 Claims**



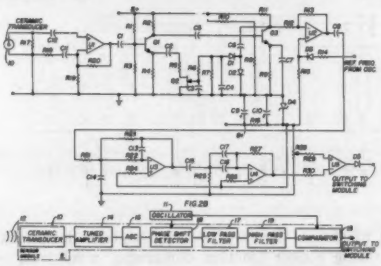
1. A device for measuring air flow comprising a housing defining a receptacle, displaceable means in the receptacle dividing the receptacle into a high pressure chamber at one side and a low pressure chamber at the other side, means defining an opening in the housing providing a port in communication with the high pressure chamber and a port in communication with the low pressure chamber, said port in communiwith the high pressure chamber being upstream of the port in communication with the low pressure chamber, means in said opening upstream of the port in communication with the low pressure chamber and downstream of the port in communication with the high pressure chamber for creating a pressure differential in the two chambers which is directly proportional to any change in pressure such that the displaceable member is displaced in an amount which is directly proportional to said change in pressure and kinematic means operable by the displacement of the displaceable member to produce a signal of predetermined magnitude.

4,193,055

AUTOMATIC SENSITIVITY LEVEL ADJUSTMENT

Charly Barnum, 160 Overlook Ave., Hackensack, N.J. 07601

Filed Mar. 11, 1977, Ser. No. 776,751
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—94 **8 Claims**



1. A motion detection system for coupling a power circuit to a load upon receipt of a Doppler energized ultrasonic wave characteristic of human movement and for deactivating the power circuit after cessation of human movement, comprising:

a. a transmission means for producing ultrasonic waves of a generally constant carrier frequency and amplitude to be radiated into a space to be maintained under surveillance;

b. a sensor means for receiving and for producing a first electrical signal representative of said Doppler energized ultrasonic wave;

c. a device for receiving and amplifying said first electrical signal to produce a second electrical signal, said device including a gain control means for maintaining a generally constant amplitude of said second electrical signal within a predetermined range, said device further including a first delay means having a time period such that the gain control means does not begin to function until after the lapse of said time period whereby said second electrical signals having amplitudes outside said predetermined range and having a short term duration less than said time period are unaffected by said gain control means, said time period suitably chosen such that variations of said short term duration in Doppler signal amplitudes characteristic of human motion are unaffected by said gain control means while variations in Doppler signal amplitudes characteristic of background noise and having durations greater than said time period are eliminated by said gain control means;

d. a detector means for processing said second electrical signal to produce an output signal representative of human movement in said space maintained under surveillance;

e. a switching means for producing a power circuit activation signal upon receipt of said output signal, and for producing a power circuit deactivation signal in the absence of said output signal; and

f. a connecting means responsive to said power circuit activation and deactivation signals to respectively couple and decouple the power circuit and the load.

4,193,056

OCR FOR READING A CONSTRAINT FREE HAND-WRITTEN CHARACTER OR THE LIKE

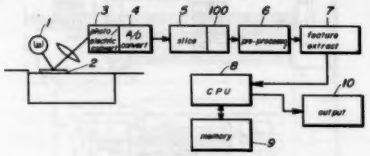
Toshiaki Morita, Nara; Hironari Takatori, Kobe; Fusao Makino, Yamatokoriyama; Syoichi Yasuda, Ikoma, and Yoshiki Nishioka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1978, Ser. No. 908,657

Claims priority, application Japan, May 23, 1977, 52-59589; May 24, 1977, 52-60115; May 24, 1977, 52-60116; May 24, 1977, 52-60117; May 25, 1977, 52-61433; May 25, 1977, 52-61434

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC 2 Claims



1. An optical character reader comprising:

memory means for storing a character pattern in addressable parallel segments, all of said segments extending in a common linear direction;

means for retrieving character pattern information from said addressable parallel segments;

classification means responsive to said means for retrieving for comparing character pattern information in retrieved adjacent segments two at a time and classifying the combined character pattern information of each two retrieved adjacent segments into a predetermined number of groups of predefined shapes without regard to specific address information within each of said segments; and

identification means for comparing the combinations of groups of predefined shapes of the respective adjacent segments with reference information to identify the character patterns, said reference information including predetermined combinations of said groups of predefined shapes for each character to be identified.

4,193,057

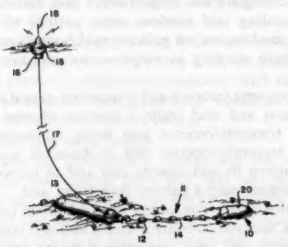
AUTOMATIC DEPLOYMENT OF HORIZONTAL LINEAR SENSOR ARRAY

Derek J. Bennett, and Daniel J. Hogan, both of Thousand Oaks, Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 20, 1978, Ser. No. 888,165

Int. Cl.[2] H04R *1/46*

U.S. Cl. 367—153 18 Claims



1. A method for deploying a linear sensor array on the ocean floor comprising the steps of deploying a vertical array on a cable between an anchor and a float, and gradually decreasing the buoyancy of the float as the float is carried away from the anchor by ocean currents.

4,193,058

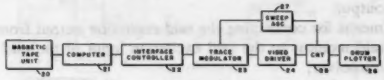
SYSTEM FOR DISPLAYING SEISMIC DATA ON A CATHODE-RAY TUBE

Clarence G. Smith, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 854,564, Nov. 25, 1977. This application Jan. 25, 1978, Ser. No. 872,271

Int. Cl.[2] G01V *1/34;* G01D *1/00*

U.S. Cl. 367—71 7 Claims



1. A seismic data processing system comprising:

(a) a cathode-ray tube,

(b) a multiplexer for successively applying seismic data for each of a plurality of seismic channels to said cathode-ray tube to intensity modulate the electron beam one time during each sweep of the electron beam across the face of the cathode-ray tube for each of the seismic channels,

(c) means for producing a sweep signal,

(d) means for applying said sweep signal to the yoke of the cathode-ray tube to drive the electron beam across the face of the cathode-ray tube,

(e) means for generating a digital reference number representative of the value of the drive current through the yoke required for the display of a predetermined number of seismic traces per unit length of sweep,

(f) means for making a measurement representative of the amplitude of the drive current through said yoke by adding the sampled value of the drive current at two spaced-apart times between which seismic data is to be displayed on the face of the cathode-ray tube,

(g) an analog-to-digital converter for digitizing said drive current measurement,

(h) a digital comparator for comparing said digitized drive current measurement with said digital reference number, and

(i) means for automatically varying said sweep signal until said digitized drive current measurement and said digital reference number are the same.

4,193,059

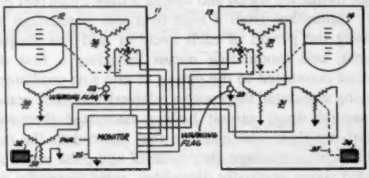
ATTITUDE INDICATOR COMPARATOR WARNING SYSTEM

Richard L. Harris, Oklahoma City, Okla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 915,708

Int. Cl.[2] G08B *21/00;* G08C *19/46*

U.S. Cl. 340—27 AT 4 Claims



2. An attitude indicator comparator warning system for a first attitude indicator and a second attitude indicator, the said first and second attitude indicators indicating the same parameter and having indicator drive motors energized from separate

sources and with each indicator having an electrically actuated flag indicator, the said warning system comprising:

a. a first transolver coupled to the said motor drive of the said first attitude indicator and having an electrical excitation input and an electrical output;

b. a second transolver coupled to the said motor drive of the said second attitude indicator and having an electrical input and a sine and cosine electrical output;

c. means for interconnecting the said electrical output of the first transolver with the electrical input of the said second transolver;

d. a comparator warning monitor having an excitation output, a sine input, a cosine input, and a flag excitation output;

e. means for connecting the said excitation output from the said monitor to the said excitation input of the said first transolver;

f. means for connecting the sine output from the said second transolver to the said sine input of the said monitor, and connecting the said cosine output from the said second transolver to the said cosine input of the said monitor; and

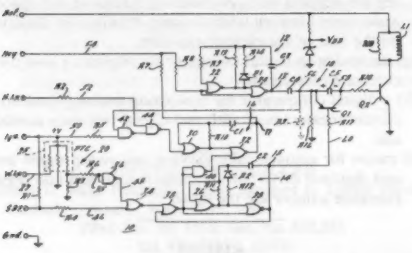
g. means for connecting the said flag excitation output of the said monitor to the said electrically actuated flag indicator of both the said first and said second attitude indicators whereby the said flag indication is responsive to the said sine output and the said cosine output from the said second transolver.

4,193,060

CONTROL CIRCUIT FOR A TONE GENERATOR

Michael Slavin, Troy, and Irvin B. Rea, Royal Oak, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Filed Nov. 1, 1978, Ser. No. 956,606
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—52 D **21 Claims**



1. In a control circuit for a tone generator that is adapted to cause said tone generator to produce a chime sound including a first oscillator for producing a relatively high frequency signal and a second oscillator for producing a relatively low frequency signal, the improvement comprising:

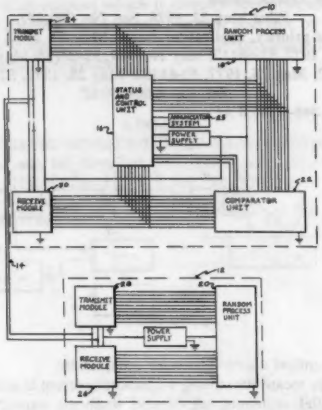
modulating means for producing a pulse width modulated substantially square wave signal at the frequency of said high frequency signal and having a duty cycle that gradually diminishes from a high to a low percentage value during the period of each cycle of said low frequency signal; said modulating means including a first decay circuit connected to the output of said first oscillator and having associated therewith a relatively fast time constant, a second decay circuit having associated therewith a relatively slow time constant that determines the rate at which the percentage duty cycle of said pulse width modulated signal gradually diminishes, reset means for resetting said second decay circuit in accordance with said low frequency signal, and threshold means connected to the output of said second decay circuit for producing said pulse width modulated signal.

4,193,061

ELECTRONIC AUTHENTICATION SYSTEM

John T. Zoltai, P.O. Box 5463, Santa Fe, N. Mex. 87502

Filed Jul. 11, 1978, Ser. No. 923,749
Int. Cl.[2] H04Q *3/02*
U.S. Cl. 371—67 **7 Claims**



1. An electronic authentication system comprising in combination:

a remote unit comprising:

a random process unit to receive a random input pattern, said random process unit having a predetermined program configuration, said random process unit having a plurality of random process boards, each having a random output configuration respectively, said random process unit decoding said random input pattern to provide a remote random output pattern, said remote random output pattern varying in response to said random input pattern, and

a transmit/receive unit connected to said random process unit to transfer said random input pattern to said random process unit and to transmit said remote random output pattern from said random process unit; and

a control unit comprising:

a status/control means for generating a continuously varying random input pattern, said random input pattern containing a predetermined number of impulses and occurring at a predetermined interval, said random input pattern having a predetermined pattern length, said predetermined pattern length being variable,

a control random process unit connected to said status/control means to receive said random input pattern, said control random process unit having a predetermined wiring configuration, said random process unit having a plurality of random process boards, each having a random output configuration respectively, said random process unit decoding said random input pattern to provide a control random output pattern, said control random output pattern varying in response to said random input pattern,

a control transmit/receive unit connected to said status/control means and said control random process unit, said control transmit/receive unit being connected to said remote transmit/receive unit to transmit said random input pattern to said remote unit and to receive said remote random output pattern therefrom, and,

a comparator means connected to said control random process unit, said status/control means and said control transmit/receive unit, said comparator means receiving and comparing said control random output pattern and said remote random output pattern to provide a control signal to said status/control means, said comparator generating said control signal whenever a mismatch or error occurs

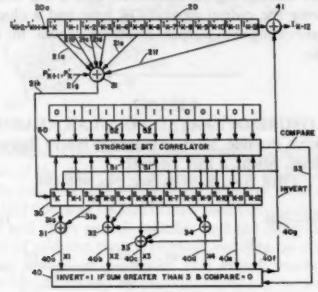
in received random output patterns, said control signal activating said status/control means to generate an alarm.

4,193,062

TRIPLE RANDOM ERROR CORRECTING CONVOLUTIONAL CODE

John En, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Jun. 29, 1978, Ser. No. 920,173
Int. Cl.[2] G06F *11/12*
U.S. Cl. 371—43 **15 Claims**



3. A method of decoding transmitted information bits I_K from received information bits I_K' and received parity bits P_K' where I_K' equals I_K plus a random error bit e_K^i, P_K' equals transmitted parity bit P_K plus a random error bit e_K^p, and $K=1, 2, \ldots$ comprised of the steps of:

generating a syndrome bit S_K for each of said received bits I_K', where S_K is the modulo 2 sum of received bits P_K', I_K', I_{K-}', I_{K-2}', I_{K-3}', I_{K-5}', and I_{K-12}',

forming the modulo 2 sums $X1=S_K+S_{K-2}$, $X2=S_{K-3}+S_{K-4}+S_{K-7}$, $X3=S_{K-5}+S_{K-6}+S_{K-10}$, $X4=S_{K-8}+S_{K-9}$ and,

inverting bit I_{K-12}' on the condition that more than three of said modulo 2 sums X1, X2, X3, X4, S_{K-11} and S_{K-12} equal one.

4,193,063

DIFFERENTIAL CAPACITANCE MEASURING CIRCUIT

James J. Hitt, Willow Grove, and George C. Mergner, Glenside, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed May 15, 1978, Ser. No. 905,688
Int. Cl.[2] G08C *19/00*; G01R *27/26*
U.S. Cl. 340—200 **10 Claims**

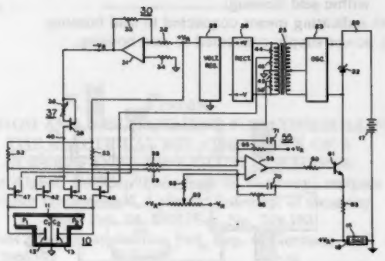
6. A transmitter for producing an output current varying linearly in magnitude in accordance with the displacement of the central plate of a differential capacitor with respect to the side plates of said differential capacitor comprising

a source of constant direct current,

capacitance discharge means,

first means for periodically connecting the capacitances between said central plate and said side plates to said source of constant direct current for a predetermined time interval and for connecting said capacitances to said capacitance discharge means between said periodic connections,

integrating means having an input and an output, said input being connected by said first means to said side plates of said differential capacitor during the time said capacitances are connected to said capacitance discharge means, and



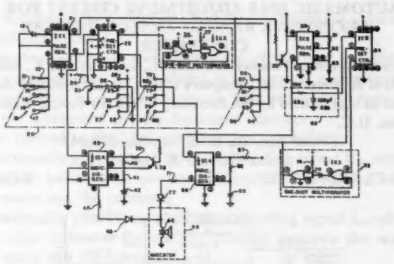
current control means connected to said output of said integrating means to produce an output current varying as said displacement of said central plate.

4,193,064

MULTIPLE PULSE TIMER

Michael D. Snyder, 4 Fairway Ct., Bridgewater, N.J. 08807

Filed Sep. 7, 1978, Ser. No. 940,319
Int. Cl.[2] G08B *7/00*
U.S. Cl. 340—309.4 **11 Claims**



1. A timer comprising:

first pulse generating means to generate a first series of pulses at a first selectable repetition rate;

second pulse generating means to generate a second series of pulses at a second repetition rate;

connection means to connect the first pulse generating means to the second pulse generating means to initiate the operation of the second pulse generating means after a selected number of pulses of the first series; and

indicator means connected to the first and second pulse generating means to indicate separately the occurrence of pulses in each of the first and second series of pulses.

4,193,065

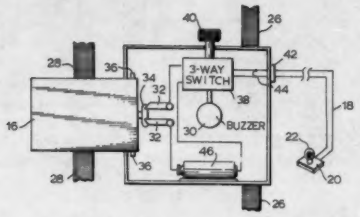
GOLF SWING CONTROL ALARM

Louis M. Bittner, 1144 W. River Dr., Margate, Fla. 33063

Filed Oct. 20, 1978, Ser. No. 953,084
Int. Cl.[2] A63B *69/36*; G08B *21/00*
U.S. Cl. 340—323 R **3 Claims**

1. A device for providing an indication to a golfer during a golf swing that one of the golfer's arms has moved from a substantially straight in line position to a bent position at the elbow comprising:

a housing;
a moveable member pivotally mounted at one end of said housing, said one lower surface of said member lying in the same plane as the surface of said housing in a first position;
an electrical contact connected at one end of said member within said housing;
an indicating means connected to said housing;
a power supply connected to said housing;



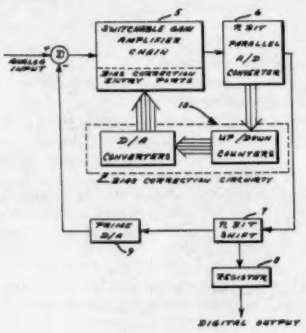
a means for completing the circuit between said power supply and said indicating means connected in said housing and disposed relative to said contact mounted on said member whereby in a first position said contact means does not engage said contact member when said member is in the same plane as the lower surface of said housing and which in a second position engages the contact to complete the circuit when said moveable member is in an angular position relative to the plane of the housing.

4,193,066

AUTOMATIC BIAS ADJUSTMENT CIRCUIT FOR A SUCCESSIVE RANGED ANALOG/DIGITAL CONVERTER

Steven Morrison; Thomas K. Lisle, Jr., and Clarence C. Glover, all of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 20, 1978, Ser. No. 898,047
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 CC **2 Claims**



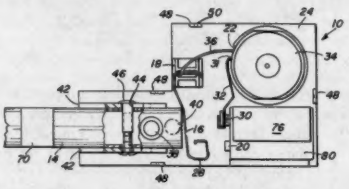
1. In a successive ranged analog/digital converter having a switchable gain amplifier chain and an n bit parallel analog/digital converter, the improvement of an automatic bias adjustment circuit, said automatic bias adjustment circuit comprising
up/down counter means,
digital/analog converter means driven by said up/down counter means and providing bias correction signals in response thereto, said bias correction signals being fed to said switchable gain amplifier chain,
a logic circuit for developing from said n bit parallel analog/digital converter first and second logic functions, said logic functions defining a given sub-range,
up/down counter actuating means receiving said first and second logic functions and clock signals, said actuating means enabling said up/down counter means in response to said first logic function and effecting counting thereby in a direction dictated by the state of said second logic function,
disabling means for disabling said up/down counter actuating means in response to logic functions defining the first sub-range of said successive ranged analog/digital converter,
said disabling means comprising a dual input OR gate connected to receive logic function inputs from said n bit parallel analog/digital converter, and a flip flop circuit receiving the output of said OR gate and a clock signal and providing an output disabling signal in response thereto.

4,193,067

CLOSURE OPERATED BURGLAR ALARM

Gary Hawkins, Pontiac, Mich., assignor to Harry Belcastro, Sr., Birmingham, Mich., a part interest

Filed Nov. 6, 1978, Ser. No. 958,194
Int. Cl.[2] G08B *13/08*
U.S. Cl. 340—546 **10 Claims**



1. A burglar alarm for closures, such as doors and windows, having a bottom member and a cover comprising:
an alarm responsive to an electrical signal;
a switch means including a leaf spring means for interconnecting the alarm to a power source;
a longitudinally translatable rod movable from a first position, whereby the switch means is open, said rod adjacent an edge of said closure when the closure is near a closed position, and to a second position wherein the switch means is maintained closed, sounding the alarm;
said leaf spring means having one end spacedly fixed relative to the rod and biasing an end of the rod in the first position;
means for releasably holding the rod latched in the second position when the second position has been reached;
means for guiding the rod from the first position to the second position; and
means for adjusting the length of the rod to extend from a fixed surface to a movable surface of a door or window whereby an attempt to open the door or window moves the rod to said second position to sound the alarm.

4,193,068

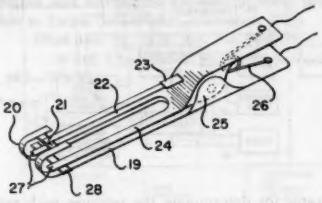
HEMORRHAGE ALARMS

John J. Ziccardi, R.D. #1, Evans City, Pa. 16033

Continuation-in-part of Ser. No. 667,390, Mar. 16, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,147
Int. Cl.[2] G08B *21/00*; H01H *35/00*
U.S. Cl. 340—604 **5 Claims**

1. A hemorrhage alarm system comprising an electrically operated signal device, a source of electrical current, a circuit connecting said source of electrical current and said signal device, mechanical switch means in said circuit having two separate elongate switch members, one of said switch members

generally surrounding the other on at least two sides opposite of the other switch member in its direction of movement whereby a wound dressing cannot interfere with the function of the switch, contact means on one end of said other switch member, corresponding contact means on one side of said other switch member, said other switch member being pivotally connected to said one switch member intermediate their lengths and movable only between said at least two sides within the surrounding one switch member between an open spaced apart position in which said contact means on the other



switch member is spaced from the contacts on said one of said two sides of the one switch member and a closed position in which the two contacts are engaged, resilient means normally holding said contacts on said switch members apart, and means between said other switch member and the other side of said two sides of said one switch member swelling on contact with blood and body fluid acting on said switch mechanically to close the two normally spaced apart contacts by moving said other switch member toward said one switch member and overcoming the resilient means on contact with sufficient blood and body fluid to swell the same.

4,193,069

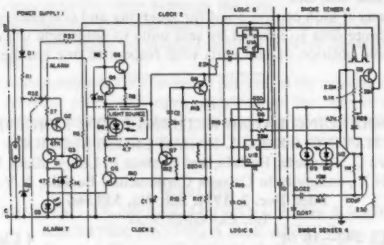
LATCHING ALARM SMOKE DETECTOR

Glenn F. Cooper, Hingham, and Robert B. Enemark, Duxbury, both of Mass., assignors to American District Telegraph Company, Jersey City, N.J.

Filed Mar. 13, 1978, Ser. No. 885,370

Int. Cl.[2] G08B *17/10*; G01N *21/28*

U.S. Cl. 340—630 **5 Claims**



1. Electrical apparatus for detecting an alarm condition comprising:

means for sensing a physical condition;

clock means controlling supply of periodically recurring power pulses to the sensing means such that the sensing means produces signal pulses at the clock rate upon sensing a predetermined physical condition; and

logic means coupled to the clock and sensing means and responsive to substantially synchronous clock and signal pulses therefrom to produce an alarm signal;

wherein the logic means includes means timing a delay interval for a plurality of clock pulse periods, a two condition device responsive to substantially synchronous clock and signal pulses to activate the timing means independently of signal pulses, and means responsive to uninterrupted recurrence of condition signal pulses during the delay interval to latch the logic means in alarm signal condition.

4,193,070

METHOD AND ARRANGEMENT FOR CONTROLLING THE ELECTRICAL RELATIONSHIPS OF A CURRENT-INTENSIVE GLOW DISCHARGE

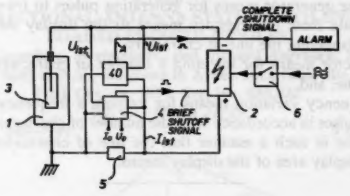
Werner Oppel, Cologne, Fed. Rep. of Germany, assignor to Klockner Ionon GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 16, 1977, Ser. No. 769,163

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606395

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—650 **9 Claims**



1. An improved control method for controlling a glow-discharge treatment,

the glow-discharge treatment being of the type in which a workpiece is accommodated in a treatment container and subjected to a glow-discharge field established between the workpiece and the treatment chamber,

the control method being of the type comprising:

continually generating a voltage-indicating signal U_{ist} whose value indicates the potential difference between the workpiece and the container,

continually generating a current-indicating signal I_{ist} whose value indicates the current flowing between the workpiece and the container, and

applying the voltage- and current-indicating signals U_{ist} and I_{ist} to a discharge-disturbance-responsive switching device operative for briefly interrupting the glow-discharge treatment for a limited predetermined time interval when the voltage- and current-indicating signals in conjunction assume values indicating the development of an arc discharge,

the improvement comprising

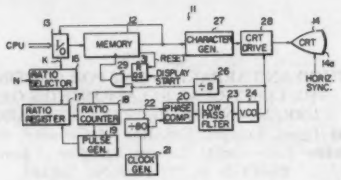
furthermore detecting the existence of a short-circuit between the workpiece and treatment container, this comprising using comparators to compare the voltage-indicating signal U_{ist} against a predetermined threshold voltage level U_O and to compare the current-indicating signal I_{ist} against a predetermined threshold current level I_O, and generating a shutdown signal effecting persisting complete shutdown of the glow-discharge treatment when U_{ist} is below U_O and concurrently I_{ist} is above I_O,

whereby the detection of a short-circuit and the resultant generation of the shutdown signal prevent the discharge-disturbance-responsive switching device from effecting protractedly repeated brief interruption and resumption of the glow-discharge treatment in the case of a short-circuit between the workpiece and the container.

4,193,071
CHARACTER DISPLAY APPARATUS

Keiji Hasegawa, and Yoshikuni Tatara, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,546
Claims priority, application Japan, Oct. 21, 1976, 51/126639
Int. Cl.[2] G06K 15/20
U.S. Cl. 340—723 10 Claims



1. A display apparatus comprising:

memory means for storing data representing a line of characters;

display means for displaying the line of characters;

pulse generator means for generating pulses to transfer the data from the memory means to the display means for displaying the line of characters;

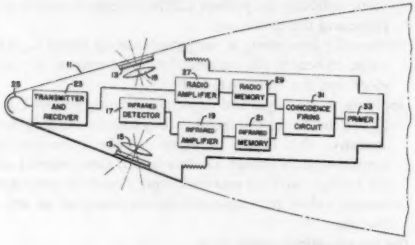
selector means for selecting a number of characters in the line; and

frequency variation means for varying a frequency of the pulses in accordance with the number of characters in the line in such a manner that the line of characters fills a display area of the display means.

4,193,072
COMBINATION INFRARED RADIO FUZE

Wayne L. McKusick, Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 13, 1962, Ser. No. 177,617
Int. Cl.[2] F42C 13/02, 13/04; G01S 9/02
U.S. Cl. 343—6 ND 3 Claims

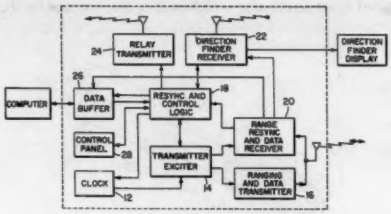


2. A combination proximity fuze comprising a radio circuit and an infrared circuit, said radio circuit operative to produce a first voltage impulse when a reflected electromagnetic wave is received from a target, said infrared circuit operative to produce a second voltage impulse when a heat source from a target is detected, a first memory circuit connected to said radio circuit for storing said first voltage impulse for a first predetermined time interval, a second memory circuit connected to said infrared circuit for storing said second voltage impulse for a second predetermined time interval, a coincidence firing circuit connected to said first memory circuit and to said second memory circuit whereby a primer may be ignited when said first and second voltage pulses are applied to said coincidence firing circuit simultaneously within said first and second predetermined time intervals.

4,193,073
METHOD AND APPARATUS FOR POSITION DETERMINATION

Hubert Kohnen, 1928-B Sparrow Dr., Point Mugu, Calif. 93041

Filed Jan. 16, 1968, Ser. No. 699,758
Int. Cl.[2] G01S 9/06
U.S. Cl. 343—6 R 6 Claims



3. Apparatus for determining the position with respect to one another of a plurality of geographically-separated units, said apparatus comprising:

a timing device forming part of each unit;

means for synchronizing the operation of all such timing devices;

means incorporated into each unit and controlled by the timing device at such unit for transmitting a ranging signal during the initial portion of a pre-assigned time slot, the time slot pre-assigned to any one unit being distinct from the time slots pre-assigned to all other units, and the ranging signals so transmitted occurring in cyclic sequence with respect to one another;

means incorporated into each unit for receiving in cyclic sequence the ranging signals transmitted from said other units wherever such signals are detectable and for ascertaining the range from itself to the unit transmitting a particular detected ranging signal as a function of the signal propagation interval;

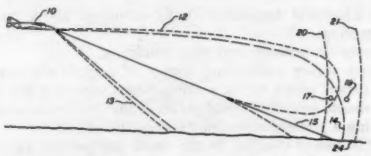
means incorporated into each unit for relaying to a central point during a terminal portion of each particular time slot the range data so ascertained from the ranging signal transmitted during the initial portion of that particular time slot; and

means at such central point for receiving and correlating the range data so relayed by said units to determine the relative position of said units with respect to one another.

4,193,074
ENHANCING RADAR RETURNS FROM TARGETS HAVING A SMALL RADAR CROSS SECTION

Edward C. Schwartz, Buffalo, and Thomas F. Leney, Elma, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Dec. 3, 1974, Ser. No. 530,566
Int. Cl.[2] G01S 9/22
U.S. Cl. 343—16 M 4 Claims



4. A method for locating one target in the presence of a second target in the same pulse packet by separating said targets in the monopulse plane including the steps of:

directing a radar antenna boresight at said second target;

transmitting a radar signal in difference pattern; and

processing return signals, whereby if said one target is pres-

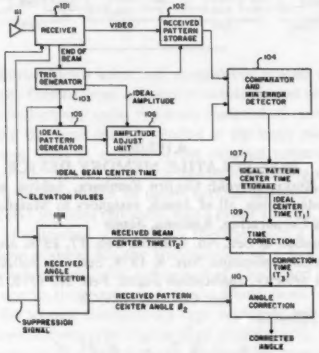
ent in any pulse packet and located in one of the lobes of the difference pattern transmission, return signals from said one target will be maintained while return signals from said second target will be suppressed and thereby the presence of said one target will be identified and said one target located.

4,193,075

LOW ANGLE ELEVATION GUIDANCE SYSTEM

Gustav Blazek, and Arthur Charych, both of Stony Brook, N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 29, 1978, Ser. No. 920,479
Int. Cl.[2] G01S 1/16, 1/54
U.S. Cl. 343—108 M **7 Claims**



6. A method for improving the accuracy of aircraft guidance systems in which a ground station transmitting system transmits a sweeping beam and beam angle information to an airborne receiving system which determines the angle of the aircraft from the received beam pattern and the beam angle information, comprising the steps of:

(a) producing an ideal pattern within the receiving system,

(b) comparing said ideal pattern with the received pattern to determine the error between the two,

(c) shifting the received and ideal patterns in relative amplitude and phase to produce minimum error between the two, and

(d) substituting for the received pattern, in the portion of the receiver processing used to determine the correct angle information, the idealized pattern at the relative amplitude and phase which produced the minimum error in step (c).

4,193,076

COUPLING AN OUTER ANTENNA WITH A RADIO RECEIVER HAVING A BAR ANTENNA

Ryosuke Ito, and Susumu Takahashi, both of Tokyo, Japan, assignors to Sansui Electric Co. Ltd., Tokyo, Japan

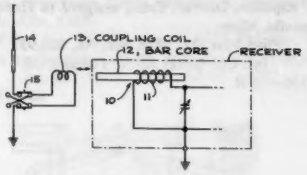
Filed Apr. 24, 1978, Ser. No. 899,224
Claims priority, application Japan, Apr. 26, 1977, 52-48070
Int. Cl.[2] H01Q 1/24, 7/08
U.S. Cl. 343—702 **9 Claims**

1. A method for coupling an outer antenna with a radio receiver having a bar antenna, which comprises:

preparing a coupling coil means which is able to be removably mounted on a bar core of the bar antenna and which is impedance-matched with the outer antenna;

connecting said coupling coil means between the outer antenna and ground; and

mounting said coupling coil means onto the bar core of the bar antenna to electromagnetically couple said coupling coil means with a loop antenna coil of the bar antenna by inserting the bar core in a hollow portion of said coupling coil means under control of axial orientation of said coupling coil means so that a signal received at the outer



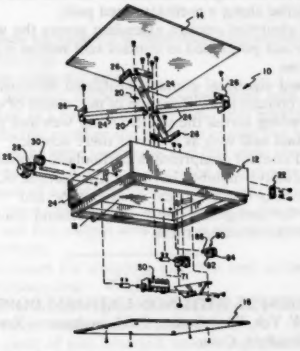
antenna may not cancel, but be added to a signal received at the bar antenna itself.

4,193,077

DIRECTIONAL ANTENNA SYSTEM WITH END LOADED CROSSED DIPOLES

Harry Greenberg, Kerhonkson, and Richard Auerbach, Southtown, both of N.Y., assignors to Avnet, Inc., Ellenville, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,833
Int. Cl.[2] H01Q 21/26
U.S. Cl. 343—747 **9 Claims**



1. An elongated arm for use in a high frequency, directable antenna system for use with a receiver operating over a predefined reception band, said system having: a plurality of crossed dipole antenna components of substantially shorter length than a half wavelength of any frequency to be received, each of said dipole components being positioned to receive a signal from a different predetermined direction, each of said dipole components including a first and second of said elongated arms arranged in longitudinal alignment; selector means coupled to each of said dipole components and operable to produce a composite signal combining selected ones of the signals received by said dipole components; said elongated arm comprising

a portion in the form of a conductive channel member with a generally U-shaped cross-section, said channel member including substantially parallel sides and a bottom,

said bottom being removed over a section of said channel member near one end thereof,

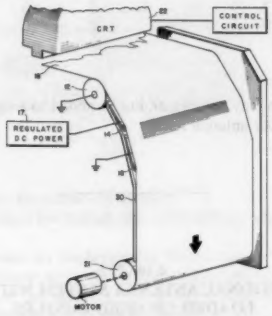
the parallel sides of said section being folded toward the opposite end of said arm to form a generally wedge-shaped, flared front for said arm.

4,193,078

ELECTRICAL CONTACT FOR CONDUCTIVE-BACKED PAPER

Ralph H. Esposito, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 22, 1978, Ser. No. 888,921
Int. Cl.[2] G01D *15/10*; H05B *1/00*
U.S. Cl. 346—76 R **4 Claims**



1. A recorder for recording information on a web of conductive-backed material in which a latent recorded image developed by heat generated by electricity passing through the conductive backing, comprising in combination:

means for driving the conductive-backed web of recording material along a predetermined path;

a first electrical contact extending across the width of said web and positioned to contact said web as it moves there across;

a second electrical contact positioned downstream of said first contact in the direction of movement of said web and extending across the width of said web and positioned to contact said web as it moves there across;

second contact comprising a particulate, resilient, electrical conductive member having a low thermal mass having a uniformly low electrical conductivity; and

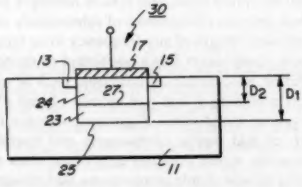
means for energizing said first and second contacts as said web moves across them.

4,193,079

MESFET WITH NON-UNIFORM DOPING

Keming W. Yeh, Westchester, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,331
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—22 **1 Claim**



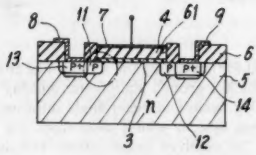
1. A high frequency FET having a channel region with a given dosage concentration and wherein said channel region contains an implant, said implant having a first dosage concentration at a first distance from a gate of said FET and a second dosage concentration at a second distance from the gate and wherein said first distance is larger than said second distance and said first dosage concentration is larger than said second dosage concentration, and said second dosage concentration is larger than the given dosage concentration of said channel region, said implant contains first and second implants, said first implant corresponding to said first dosage concentration and said second implant corresponding to said second dosage concentration in which each of the first and second implants is spatially arranged in a predetermined manner relative to the other, said first implant has a dosage N1 and said second implant has a dosage N2 and wherein said first implant is substantially spaced from said gate a first distance D_1 and said second implant is spaced from said gate a distance D_2 and wherein the capacitance of said FET varies inversely with said first distance D_1 and wherein the transconductance of said FET varies proportionally to the concentration of the said first dosage.

4,193,080

NON-VOLATILE MEMORY DEVICE

Susumu Koike, Ibaraki; Ginjiro Kambara, Ashiya, and Toshio Matsuda, Ootsu, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 658,535, Feb. 17, 1976, abandoned.
This application Nov. 9, 1978, Ser. No. 960,450
Claims priority, application Japan, Feb. 20, 1975, 50/21636
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **4 Claims**



1. A non-volatile memory device comprising:

a semiconductor substrate of a first conductivity type;

a source region and a drain region which are formed having a predetermined space between each other in said semiconductor substrate, each region having a second conductivity type opposite to said first conductivity type;

a first gate insulating layer formed on said substrate and having a uniform and very small thickness, said first gate insulating layer extending between said source region and said drain region;

a second gate insulating layer formed on and coextensive with said first gate insulating layer and being substantially thicker than said first insulating layer;

a gate electrode formed on said second gate insulating layer;

a source electrode formed to make ohmic contact with said source region;

a drain electrode formed to make ohmic contact with said drain region;

said substrate further comprising:

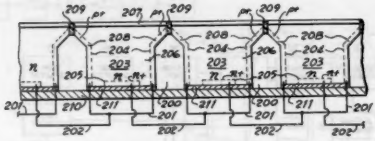
a first region extending from said source region toward said drain region and having said second conductivity type and a lower impurity concentration than said source region;

a second region extending from said drain region toward said source region and having said second conductivity type and a lower impurity concentration than said drain region, said first gate insulating layer having peripheral edges on at least one part of said first extended region and on at least one part of said second extended region, but not on said source region and said drain region.

4,193,081
MEANS FOR EFFECTING COOLING WITHIN ELEMENTS FOR A SOLAR CELL ARRAY

Roy Kaplow, Newton, and Robert I. Frank, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 24, 1978, Ser. No. 889,952
Int. Cl.[2] H01L *31/00, 27/14*
U.S. Cl. 357—30 16 Claims

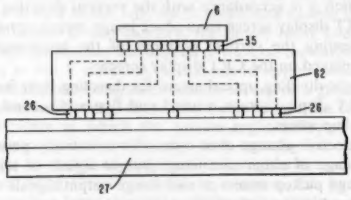


1. A semiconductor solar cell comprising spaced elongate parallel units formed from a common substrate and comprised of a first conductivity type, the body material of each of said units having the same spaced relation to the body material of other of said units as existed in the original substrate from which they are formed, each unit having upstanding sidewalls and having therebetween an upper surface adapted for exposure to receive incident radiation, and a lower surface, adjacent sidewalls of adjoining units having therebetween a first elongate passage adapted for the transmission of a heat transfer medium, each unit sidewall comprised of a localized region of a second conductivity type and ohmic connections extending between the second conductivity type region of one unit and the first conductivity type region of an adjacent unit, whereby the transmission of a heat transfer medium between the adjacent sidewalls of adjoining units maintains the temperature at said localized region of a second conductivity type less than the upper surface temperature of the semiconductor solar cell.

4,193,082
MULTI-LAYER DIELECTRIC STRUCTURE

William E. Dougherty, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,214
Int. Cl.[2] H01L *39/02*
U.S. Cl. 357—80 11 Claims

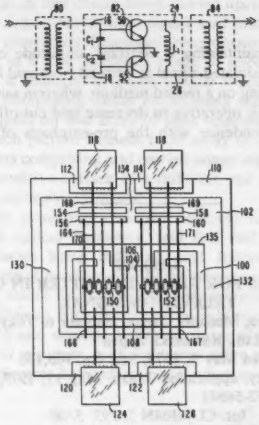


1. A planar semiconductor structure comprised of a unitized dielectric body formed of a plurality of dielectric planar layers, a plurality of conductor leads extending between original adjacent layers of said body and substantially coextensive with the planes of said layers and each having exposed terminations at the edge surfaces of said layers with said edge surfaces disposed at the ends of the original interfaces of said layers, and a semiconductor device mounted on a said edge surface in electrical connection to said terminations with said device mounted along lines coextensive with said interfaces of said layers.

4,193,083
PACKAGE FOR PUSH-PULL SEMICONDUCTOR DEVICES

Lee B. Max, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 757,716, Jan. 7, 1977, Pat. No. 4,107,728.
This application Aug. 14, 1978, Ser. No. 934,133
Int. Cl.[2] H01L *39/02, 23/02, 23/12*
U.S. Cl. 357—80 14 Claims



1. A common package for at least two active semiconductor devices comprising:

at least one dielectric member;

a pair of mutually electrically isolated input area portions comprised of a first conductive input area portion on said one dielectric member and a second conductive input area portion in the same package as said first input area portion;

a pair of mutually electrically isolated output area portions comprised of a first conductive output area portion and a second conductive output area portion in the same package as said first output area portion and said pair of input area portions;

inductive means for coupling said first and second output area portions; and

a common conductive ground area disposed proximate said pairs of input and output area portions;

whereby each of said first and second input area portions and each of said first and second output area portions are in such a spatial relationship with said ground so as to form a portion of an electrical circuit in cooperation with said semiconductor devices.

4,193,084
VIDEO RECORDER HAVING MEANS FOR MAINTAINING CONSTANT THE AMPLITUDE OF THE FREQUENCY-MODULATED SIGNAL

Kazuo Yamagiwa, Tokyo; Kaneo Saito, Yokohama, and Toshihiko Numakura, Kamakura, all of Japan, assignors to Sony Corporation, Tokyo, Japan

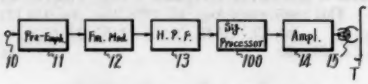
Filed Oct. 13, 1977, Ser. No. 841,793
Claims priority, application Japan, Oct. 20, 1976, 51-125829
Int. Cl.[2] H04N *5/785;* G11B *5/04*
U.S. Cl. 358—4 25 Claims

1. Apparatus for processing a video signal to be recorded, comprising

pre-emphasis means for pre-emphasizing a frequency signal in said video signal to produce a pre-emphasized video signal;

modulating means for frequency modulating a carrier with the pre-emphasized video signal to be recorded;

high pass filter means for limiting the frequency band of the frequency modulated signal from said modulating means, in which said high pass filter is an active filter adapted to have its cut-off frequency varied; and



means for maintaining a constant amplitude of said frequency modulated signal as derived from said filter means for recording on a record medium, wherein said maintaining means is operative to decrease said cut-off frequency in correspondence with the pre-emphasis of the video signal.

4,193,085

APPARATUS FOR REMOVING JITTER IN COLOR TELEVISION SIGNAL

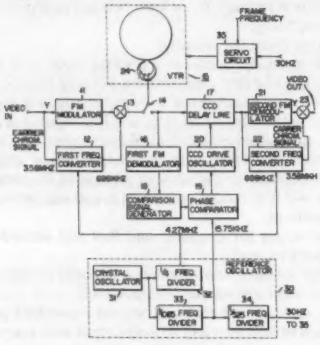
Makoto Imamura, Machida, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 5, 1978, Ser. No. 903,135

Claims priority, application Japan, May 17, 1977, 52-56801; May 17, 1977, 52-56802

Int. Cl.[2] H04N 5/795, 5/08

U.S. Cl. 358—8 **15 Claims**



1. An apparatus for removing jitter in a color signal comprising: means for modulating a luminance signal; first frequency converting means for converting a chrominance signal into a low frequency signal on the basis of a first reference signal; video signal record/play-back means in which signals outputted from said modulating means and frequency converting means are summed in an adder and the summed signal is recorded on a recording medium on the basis of a second reference signal; jitter detection means for detecting a comparing signal from a color signal played back by said record/play-back means; jitter correction means in which said comparing signal and a third reference signal are phase-compared and said play-back color signal is time-delayed on the basis of the result of the comparison; means for demodulating the luminance signal of said play-back color signal jitter-corrected by said jitter correction means; second frequency converting means converting the chrominance signal of said play-back color signal jitter corrected into a high frequency signal on the basis of said first reference signal; and means for generating first, second and third reference signals.

4,193,086

CONVERGENCE DETECTING DEVICE FOR COLOR PICTURE TUBE

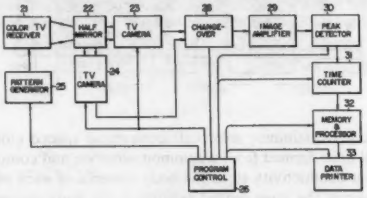
Ikuo Kawaguchi, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 23, 1978, Ser. No. 871,253

Claims priority, application Japan, Jan. 24, 1977, 52-5894

Int. Cl.[2] H04N 9/62

U.S. Cl. 358—10 **5 Claims**



1. A convergence detecting device for a color picture tube which is provided with beam deflection adjusting means and which is to be subjected to convergence alignment, comprising:

(a) pattern display signal generating means for supplying to said color picture tube a pattern display signal for displaying at least one red line, green line and blue line or portions thereof in each of the horizontal and vertical directions on a CRT display screen of said color picture tube, said display signal being capable of displaying said red, green and blue lines or portions thereof at the same position on the CRT display screen when supplied to a color picture tube having been subjected normally to convergence alignment;

(b) first image pickup means for picking up an image from the CRT display screen by a line scan having a direction which is in accordance with the horizontal direction of the CRT display screen to produce image output signals representing the horizontal positions of the vertical lines displayed on the CRT display screen;

(c) second image pickup means for picking up an image from the CRT display screen by a line scan having a direction which is in accordance with the vertical direction of the CRT display screen to produce image output signals representing the vertical positions of the horizontal lines displayed on the CRT display screen;

(d) light-dividing optical means for directing light from the CRT display screen toward said first and second image pickup means;

(e) selective change-over means for selectively permitting passage of either said image output signals of said first image pickup means or said image output signals of said second image pickup means;

(f) line period specifying means for specifying a predetermined line period of said image output signals selectively appearing from said change-over means; and

(g) single detecting means for detecting the differences between the displayed positions represented by said image output signals corresponding to said red, green and blue lines,

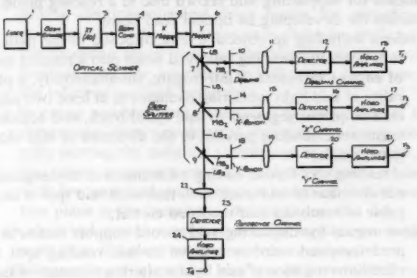
whereby misalignment of the positions of said red, green and blue lines in said predetermined line period in both the horizontal and vertical directions can be detected by said single detecting means connected to said first and second image pickup means through said change-over means.

4,193,087

SYSTEM FOR AUTOMATICALLY DIGITIZING ENGINEERING DRAWINGS

Norman G. Altman, Stamford, Conn., assignor to Altman Associates, Inc., Stamford, Conn.

Filed May 22, 1978, Ser. No. 908,374
Int. Cl.[2] H04N 1/10
U.S. Cl. 358—93 **12 Claims**



1. An electro-optical computer-controlled scanning system adapted to accurately and rapidly digitize an original engineering or other line drawing having a horizontal X dimension and a vertical Y dimension and to store the resultant digital data, making it possible to reassemble a stored drawing with virtually the same fidelity as the original drawing, said system comprising:

A a laser beam scanner having a wide-angle deflector to sweep the beam in X and Y directions to a degree sufficient to traverse the entire X and Y dimensions of the drawing being digitized and a narrow-angle deflector whose operation is independent of the wide-angle deflector for sweeping the beam in the X and Y directions to a degree sufficient to examine any selected, relatively small region of the drawing; and

B computer means associated with said scanner and including a digital memory to extract digital information from the line drawing and to store this information to ensure the capture of virtually all information thereon, said means operating in a two-mode procedure, in the first of which the wide-angle deflector operates to make a survey along a narrow stripe extending in the X direction across the entire drawing to determine whether any drawing information is contained therein, the scanner skipping one stripe width in the Y direction if no information is found to carry out a like survey of the next stripe; and if information is then found, only the X coordinate thereof is noted and stored in said memory, the survey being completed when the scanner has skipped to traverse the entire drawing in the Y direction, an automatic switch-over to the second mode being made when a survey on a given stripe results in a finding, the second mode being a line follower operation in which the narrow-angle deflector of the scanner operates to examine each drawing line to determine its radius of curvature and singularities, each line then being thereby defined as a vector, this two-mode procedure being repeated until the entire drawing is examined and digitized.

4,193,088

OPTICAL HETERODYNE SYSTEM FOR IMAGING IN A DYNAMIC DIFFUSIVE MEDIUM

Steven E. Moran, Lakeside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1978, Ser. No. 930,283
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—95 **11 Claims**

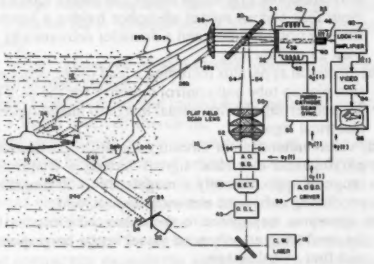
1. Optical heterodyne apparatus for extending the range at which a diffusive object may be viewed through a dynamic diffusive medium, said apparatus comprising:

an array of discrete light responsive elements, each of said light responsive elements having a light sensitive surface and comprising means for generating an electric signal that represents the light impinging upon its light sensitive surface;

lens means receiving a first coherent light signal transmitted from said object through said dynamic diffusive medium, an image of said object being carried upon the wavefront of said first coherent light signal, said first coherent light signal comprising frequency components which are included in a first frequency range of selected bandwidth which is centered at a first optical frequency, said lens means comprising means for focusing said first coherent light signal on said array of light responsive elements so that each picture element in an array of discrete picture elements comprising said carried image impinges upon the light sensitive surface of a different one of said discrete light responsive elements;

means for providing a second coherent light signal of a second optical frequency, said first and second optical frequencies being different, said frequency difference being equal to an intermediate frequency;

focusing means for focusing said second coherent light signal within an Airy disc upon the light sensitive surface of each of said discrete light responsive elements in a preselected sequence, each light responsive element generating a discrete heterodyne signal when said second coherent light signal is focused upon its light sensitive surface, each of said discrete heterodyne signals comprising an information component and a scatter interference component, the information component of the heterodyne signal generated by a given one of said light responsive elements representing the picture element of said image which impinges upon the light sensitive surface of said given light responsive element;



means receiving said heterodyne signals for filtering said scatter interference components out of said heterodyne signals;

means for directing the heterodyne signal generated by each of said light responsive elements to said filter means in said pre-selected order;

means for synchronously operating said focusing means and said directing means so that said focusing means focuses said second coherent light signal within an Airy disc upon the light sensitive surface of a particular light responsive element when the heterodyne signal generated by said particular light responsive element is directed to said filter means by said directing means;

signal exclusion means positioned between said array of light responsive elements and said filter means for preventing said filter means from receiving signals generated by any of said light responsive elements except the light responsive element upon which said second coherent light signal is focused; and

means receiving filtered heterodyne signals from said filter

means in said pre-selected order for enabling a viewable representation of said diffusive object to be provided.

4,193,089

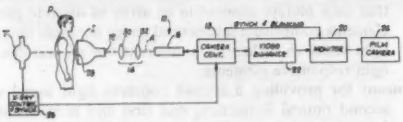
TELEVISION RADIATION IMAGING SYSTEM AND METHOD

Robert W. Brougham, Chesterland, Ohio, and Paul Mitchell, New York, N.Y., assignors to Picker Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 788,084, Apr. 15, 1977, abandoned, which is a continuation of Ser. No. 664,368, Mar. 5, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,440

Int. Cl.[2] H04N 7/18

U.S. Cl. 358—111 **32 Claims**



1. A medical diagnostic system for producing an image of a pattern of penetrative radiation emergent from a subject, said system comprising:

(a) means for directing pulsed penetrative radiation through the subject;

(b) an image tube for converting the radiation pattern to a corresponding first visual image, the image tube having an input face and an output phosphor having a substantially circular configuration and a diameter substantially greater than 25 millimeters;

(c) electrical apparatus including a lead oxide vidicon television pickup tube and control circuitry for the pick up tube for converting the first visual image to image representing electrical signals;

(d) video enhancement circuitry for disproportionately amplifying said electrical signals having a frequency in a range of approximately 1 megahertz to 20 megahertz for producing enhanced electrical signals, and

(e) apparatus responsive to the enhanced electrical signals for producing an enhanced visual image corresponding to said first visual image.

4,193,090

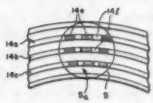
OPTICAL DETECTION SYSTEM FOR SIMULTANEOUSLY INTERROGATING A PLURALITY OF TRACKS

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 15, 1977, Ser. No. 824,681

Int. Cl.[2] H04N 5/76

U.S. Cl. 358—128.5 **5 Claims**



1. In an optical playback apparatus, an optical detection system for deriving a baseband signal comprising a time-varying information signal which baseband signal had been employed to modulate a carrier that was recorded upon a record disc in the form of a single plane elongated spiral track, which track comprises a sequence of light scattering elements arranged in a predetermined distribution along said track so that said elements collectively constitute a spatial counterpart of the modulated carrier, said optical detection system comprising:

means for supporting said record disc in a reading plane;

means for developing an optical read beam;

means, including an objective lens, disposed in the path of said beam for focusing said read beam into a reading spot of an area sufficient to interrogate, simultaneously, a plurality of said light scattering elements in at least two adjacent co-planar segments of said spiral track, said adjacent segments extending parallel in the direction of said elongated track,

said reading spot further having a dimension in the longitudinal direction of said track such that such said spot is incapable of resolving said recorded carrier;

drive means for displacing said record support means at a predetermined velocity relative to said reading spot to effect interrogation of said light scattering elements of said track segments by said spot so as to cause to be developed a diffraction pattern of said spot,

said diffraction pattern comprising a time-varying distribution of scattered and non-scattered light, said non-scattered light being representative of said baseband signal;

and light responsive means, disposed adjacent said disc and in the center of the far field of said reading spot for intercepting the non-scattered portion of said time-varying diffraction pattern and for averaging the light content of said intercepted portion to derive an electrical signal representative of the stored information in said baseband signal.

4,193,091

OPTICAL VIDEODISC READ UNIT WITH TRACKING AND FOCUSSING WOBBLERS

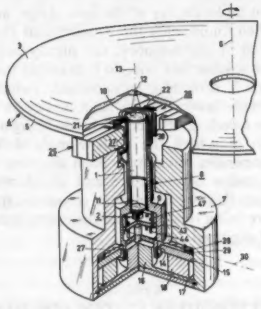
Wilhelm J. Kleuters; Gerard E. Van Rosmalen; Martinus P. M. Bierhoff, and Kornelis A. Immink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,890

Claims priority, application Netherlands, Dec. 12, 1977, 7713711

Int. Cl.[2] G11B 7/12, 7/08

U.S. Cl. 358—128.5 **9 Claims**



1. An optical read unit for optionally reading radiation-reflecting information tracks disposed in an information plane of an information carrier, which moves relative to the read unit, of the type wherein a radiation beam is focussed to a read spot in a focussing plane, which read unit comprises

a low-mass radiation source for producing the radiation beam,

a lens system for focussing the radiation beam to a read spot in the focussing plane,

optical and electronic means for receiving a radiation beam which has been reflected by the information tracks and modulated by the information in the information track and comprising a radiation-sensitive electronic detector for the conversion of the radiation-beam modulation into an electrical modulation,

a scan wobbler for an automatic tracking system and comprising electromechanical drive means for periodically moving the radiation source so as to cause the read spot in the focussing plane to move periodically about a global position with low amplitude in a direction transverse to the information track being read,

a focussing wobbler for an automatic focussing system and comprising electromechanical drive means for periodically moving the radiation source so as to cause the focussing plane to move periodically about a global position with low amplitude in a direction normal to the information plane at the location of the read spot, and

an electrical power supply circuit for supplying a supply voltage to the electromechanical drive means,

the improvement wherein at least one of the wobblers comprises:

a metal resilient rod-shaped radiation source carrier with an end to which the radiation source is secured in a satisfactory heat-conducting manner,

a metal heat sink whose thermal capacity and surface area are several times greater than those of the radiation source and to which the radiation source carrier is connected in a satisfactory heat-conducting manner at some distance from the radiation source so as to carry off heat produced at the location of the radiation source with a low temperature gradient to locations where it can be released to the environment over a sufficiently large surface area, and

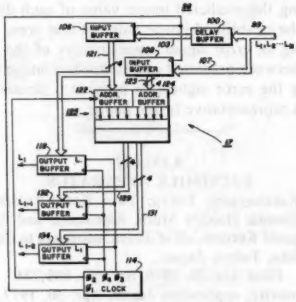
piezo-electric drive means rigidly connected to the said radiation source carrier and to parts of the read unit which are stationary relative thereto.

4,193,092

IMAGE INTERPOLATION SYSTEM

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 21, 1978, Ser. No. 917,613
Int. Cl.[2] H04N 3/14
U.S. Cl. 358—136 **13 Claims**



8. In the method of interpolating at least one intermediate line of image data from each pair of adjoining lines of image data, the steps comprising:

(a) buffering at least one binary image pixel from each of said pairs of adjoining lines of image data to provide an address;

(b) addressing a memory having discrete image pixel patterns therewithin with said address to obtain the preset image pixel pattern corresponding to said address;

(c) outputting the preset image pixel pattern addressed from said memory to provide a portion of said intermediate line; and

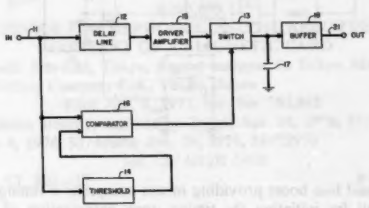
(d) repeating steps a, b, and c using additional image pixels from said pairs of adjoining lines of image data to complete said intermediate line.

4,193,093

CCD CAMERA INTERFACE CIRCUIT

Richard C. St. Clair, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1978, Ser. No. 930,835
Int. Cl.[2] H04N 5/14, 5/21, 3/14, 5/34
U.S. Cl. 358—160 **9 Claims**



1. A charge coupled device video camera interface circuit having a circuit input terminal and a video output terminal, comprising:

delay means connected to said circuit input for delaying a signal applied thereto;

a driver amplifier connected to said delay means for amplifying a signal received therefrom;

an adaptive threshold circuit connected to said circuit input;

a comparator having first and second inputs, said first input of said comparator connected to said circuit input, said second input of said comparator connected to said threshold circuit said comparator configured to produce an output signal when the signal applied to said first input of said comparator exceeds the signal applied to said second input of said comparator by a predetermined amount;

a switch having a signal input terminal, an activator input terminal, and an output terminal, said signal input terminal connected to said driver amplifier to receive a signal therefrom, said activator input terminal connected to the output of said comparator, said switch configured to open when said switch receives a signal from said comparator a buffer amplifier connected to the output of said switch;

signal storage means for storing signals connected to the output terminal of said switch and to said buffer amplifier such that when said switch to said buffer amplifier connected such that when said switch is opened, a stored signal is applied to said buffer amplifier.

a buffer amplifier connected to the output of said switch.

4,193,094

BIAS BOOST CIRCUIT FOR TELEVISION RECEIVER

William H. Counts, Lombard, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed Jun. 2, 1978, Ser. No. 911,948
Int. Cl.[2] H04N 3/18
U.S. Cl. 358—190 **5 Claims**

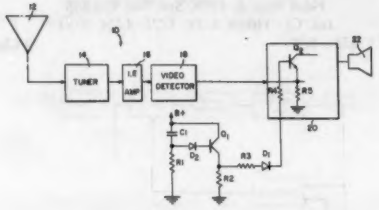
1. In a television receiver having a cathode ray tube (CRT) with a cathode element for emitting an electron beam to be scanned in raster fashion to provide an image, an image-processing circuit comprising:

(a) a source of an image representative video signal;

(b) video signal processing means for providing a processed

video signal from its output to said cathode element of said CRT;

(c) means responsive to the energization of said television receiver for providing a bias boost signal for a selected inital period of time to said processing means whereby its output is increased in accordance with the bias boost signal, said period selected dependent upon the time required for said cathode element of said CRT to emit an electron beam of steady state current density and for said processing means to reach a steady state amplifying condition; said bias boost signal decreasing from an initially high level to a steady state level at the end of said selected period, whereby the brightness of the TV images is enhanced for the selected period; and



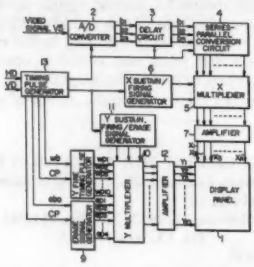
(d) said bias boost providing means comprises a timing circuit for initiating the timing upon energization of said television receiver for the selected period and for discontinuing the providing of the bias boost signal upon the completion of said selected period, said timing circuit comprises a first resistor and a capacitor, the impedance of said resistor and said capacitor being selected to establish said selected period; a power supply circuit, and said capicitor being coupled to said supply circuit so that upon energization of said television receiver said timing circuit initiates its timing operation; a transistor having a base connected to the point of interconnection between said first resistor and said capacitor; and means for preventing the rapid discharge of said capacitor when said television receiver is de-energized.

4,193,095

DRIVER SYSTEM OF MEMORY TYPE GRAY-SCALE DISPLAY PANEL

Masashi Mizushima, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 7, 1978, Ser. No. 875,798
Claims priority, application Japan, Feb. 25, 1977, 52-19245
Int. Cl.[2] H04N *5/70*
U.S. Cl. 358—241 **13 Claims**



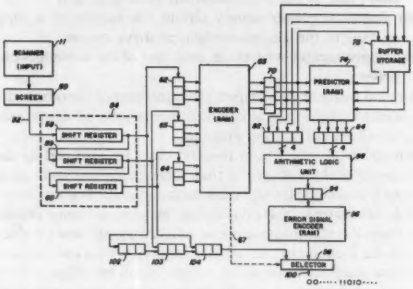
1. In a driver system of a memory type display panel including a matrix of luminescent elements each having a bi-stable operation condition of lighting and non-lighting states with the lighting states beginning when a firing pulse is applied to the luminescent elements and continuing until an erase pulse is applied to the luminescent elements, in which a gray-scale luminance is provided to the display panel by the combination of a plurality of divided lighting periods, the lighting periods being provided in the lighting states of the luminescent elements, the improvement comprising circuit means for increasing or decreasing the respective widths of the divided lighting periods in correlation with each other to control the gray-scale luminance of the display panel.

4,193,096

HALF TONE ENCODER/DECODER

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1977, Ser. No. 784,206
Int. Cl.[2] H04N *1/00*
U.S. Cl. 358—260 **10 Claims**



4. A method of compressing a stream of digital data representative of an image, the steps comprising:

scanning an original document to produce a pixel pattern representative of the image on the document;

screening the image pixel pattern to convert the image pixel pattern from an analog pixel pattern to a binary pixel pattern;

subdividing the binary pixel pattern into a succession of discrete areas each containing a preset number of digital bits;

establishing an image value for the discrete areas;

predicting the image value for the discrete areas from the established image value of at least one adjoining area;

comparing the predicted image value of each discrete area with the established image value of that area;

generating an error signal representative of the size of the error between predicted and established image values; and

encoding the error signals to provide a stream of digital signals representative of the image.

4,193,097

FACSIMILE APPARATUS

Sadasuke Kurahayashi, Tokyo; Yuzo Kato, Yokohama; Shin Tsuda, Hasuda; Hakaru Muto, Kamakura, and Asao Watanabe, Higashi Kurume, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

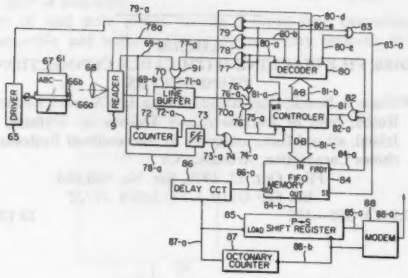
Filed Apr. 25, 1978, Ser. No. 899,724
Claims priority, application Japan, Apr. 30, 1977, 52-50241; Jun. 21, 1977, 52-73514
Int. Cl.[2] H04N *7/12*
U.S. Cl. 358—261 **9 Claims**

1. A facsimile apparatus comprising:

reader means for converting contrast signals, representative of image information recorded on an original and obtained by scanning of the original, into a two-level binary image signal sequence wherein first and second levels of binary

image signals alternately appear corresponding to the contrast signals;

compression processing means for processing the binary image signal sequence from said reader means in such manner that a first level binary image signal having a number of bits "R", which is less than a predetermined value "N", is treated as a reference signal; first level binary image signals having a number of bits "X", less than "N" and different from "R", are identified; quantities of (X-R) bit(s) related to first level binary image signals



having the number of bits "X" are converted into second level binary image signals and added to either one of the adjacent second level binary image signals between which the first level binary image signal having the number of bits "X" is located; and all first level binary signals having the number of bits "R" and the remainder bits {X-(X-R)} are eliminated from said two levels of binary image signals; and

transmitting means for transmitting the signals from said compression processing means.

4,193,098

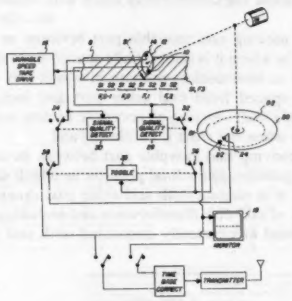
SEGMENTED VIDEO PLAYBACK APPARATUS WITH ANCILLARY RECORDING MEDIUM

James A. Bixby, San Diego; James U. Lemke, Del Mar, and Robert A. Lentz, Rancho Santa Fe, all of Calif., assignors to Spin Physics, Inc., San Diego, Calif.

Filed Mar. 24, 1977, Ser. No. 780,945

Int. Cl.[2] **H04N** *5/19;* **G11B** *5/012, 15/06*

U.S. Cl. 360—10 **10 Claims**



1. For use with a machine adapted for the playback of segmented field video information recorded on magnetic tape in the form of discrete signal tracks corresponding to the video field segments, each said signal track having recorded therein segment identifier signal information, and each video field being comprised of N segments per field, said machine having a rotary assembly of magnetic heads adapted to scan said discrete signal tracks and produce signals therefrom, apparatus comprising:

(a) ancillary magnetic recording medium;

(b) means for slaving said ancillary medium to the motion of said rotary assembly;

(c) magnetic head means for recording N tracks on said magnetic medium;

(d) means, cooperative with the magnetic heads of said scanning assembly and with said magnetic head means, responsive to segment identifier signal information produced by said scanning assembly heads, for selectively recording the field segment signals in respective tracks of said ancillary recording medium; and

(e) means for precluding the recording of signal information on said ancillary recording medium when said signal information has less than a predetermined quality.

4,193,099

DEVICE FOR REPRODUCING THE RECORDED CONTENT OF A MAGNETIC CARD

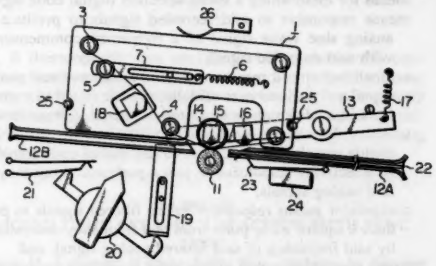
Hideaki Hayashi, Tokyo, Japan, assignor to Tokyo Magnetic Printing Company Ltd., Tokyo, Japan

Filed Apr. 4, 1977, Ser. No. 784,645

Claims priority, application Japan, Apr. 14, 1976, 51/41994; May 4, 1976, 51/49898; Jun. 19, 1976, 51/72570

Int. Cl.[2] **G11B** *5/86*

U.S. Cl. 360—17 **4 Claims**



1. A reproducing device for a magnetic card for transferring data from said card to a tape loop comprising

an endless loop of magnetic recording tape mounted in a tape pack having a continuous path and being removably mounted in the device,

means for transporting a recorded magnetic card in its own flat plane adjacent said magnetic recording tape for minimizing distortion of said card, said magnetic card having a higher coercive force than said magnetic tape, said transporting means including a capstan and a pinch roller,

a magnetic printing head positioned within said magnetic recording tape loop, means for translating said pinch roller into contact with said capstan to establish an operative arrangement with said tape and card juxtaposed therebetween thereby to form a single line of tape-to-card contact transverse of said tape and adjacent said magnetic printing head,

a reproducing head mounted along the path of said magnetic recording tape, and

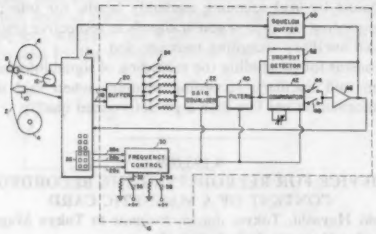
power means including first and second switch means, drive actuator means (1) for actuating said first switch means thereby to energize said capstan for rotation thereof and (2) for operating said translating means to establish said operative arrangement with said tape and card juxtaposed between said capstan and said pinch roller, a leading edge of said magnetic card contacting said second switch means thereby to energize said magnetic printing head.

4,193,100

CONTROL CIRCUIT

James S. Bagley, Littleton, and Gary J. Van Norden, Denver, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 3, 1978, Ser. No. 948,255
Int. Cl.[2] G11B *15/46*
U.S. Cl. 360—73 **12 Claims**



1. A signal conditioning circuit means for servo signals magnetically recorded on a magnetic tape wherein reproduced signals of different frequencies correspond with correlated selectively different speeds of operation of said tape, said signal conditioning circuit means comprising:

means for establishing a speed selection digital code signal,

means responsive to said recorded signals to produce an analog sine wave signal of a frequency commensurate with said recorded signal,

normalizing circuit means connected to receive said analog signal and responsive to said digital code signal to normalize said analog signals to a predetermined voltage level,

selective filter means connected to receive said normalized analog signals and responsive to said digital code signal to be selectively responsive to pass a particular frequency of said analog signals,

comparator means responsive to the filtered signals to produce a square wave pulse train of a frequency determined by said frequency of said filtered analog signal, and

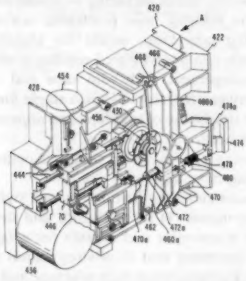
means responsive to said square wave pulse train for controlling the speed of operation of said tape.

4,193,101

COLLET LOADING APPARATUS

John A. Carlson; Kenneth D. Rusch, and David L. Sippel, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,756
Int. Cl.[2] G11B *5/012, 21/22, 5/54, 3/62*
U.S. Cl. 360—97 **10 Claims**



1. Apparatus for gripping and rotatably driving a magnetic disk having a central hole through it including:

a machine frame,

a drive hub rotatably disposed with respect to said frame,

a collet for moving toward said hub for thereby gripping the disk about its central hole between the collet and the hub,

a leaf spring supported by said frame adjacent the two ends of said spring and carrying said collet at a place intermediate the ends of the spring, and

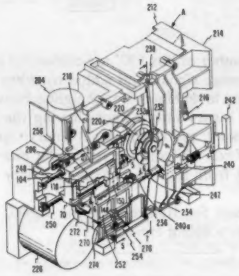
means for applying a force on said spring between its ends to longitudinally bend the spring and move said collet toward said hub to engage the disk between the collet and hub.

4,193,102

DISK FILE MACHINE WITH CABLE CONNECTION TO TRANSDUCERS

Wallace E. Beuch, Pine Island; George J. O'Konski; Kenneth D. Rusch, both of Rochester, and Thomas A. Wytaski, Pine Island, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,886
Int. Cl.[2] G11B *5/54, 5/016, 21/22*
U.S. Cl. 360—105 **16 Claims**



1. A magnetic disk drive machine including:

means for gripping and rotatably driving a magnetic disk,

a carriage embracing the disk with a pair of opposite parts of the carriage on opposite sides of the disk, one of said parts constituting a magnetic transducer,

a yielding connection of one of said parts to the remainder of said carriage making the latter part a movable part and allowing it to be moved away from the other one of said parts to allow the disk to freely move with respect to said parts,

means for moving said movable part between an original position in which it is substantially spaced from said other part and an intermediate position in which it is closer to but still spaced from said other part and including an oscillatable shaft carrying an eccentric portion which is so effective when the shaft is oscillated, and

means for moving said movable part between its said intermediate position and a final position in which said movable part is in contact with said other part except for the thickness of said disk therebetween and including an electric solenoid mechanically connected with said movable part.

4,193,103

MAGNETIC TRANSDUCER HEAD

John C. Fesler, Mackinaw, and Dennis M. Bell, Hudson, both of Ill., assignors to International Tapetronics Corporation, Bloomington, Ill.

Filed Oct. 2, 1978, Ser. No. 947,447
Int. Cl.[2] G11B *5/22, 5/10*
U.S. Cl. 360—122 **8 Claims**

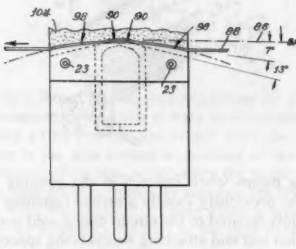
1. A magnetic transducer head, cooperable with a moving

magnetic tape to play back signals on a record track along the tape, comprising:

a casing having a front wall across which the tape is moveable;

core means within said casing having a pair of pole pieces extending in the direction of movement of the tape and having spaced inner abutting ends forming a transducing gap which projects outside said front wall of said casing for direct contact with said tape, said pole pieces having outer ends remote from the gap connected respectively to a pair of side legs;

each of said pole pieces having a front face extending smoothly and without abrupt discontinuity between the



inner and outer ends thereof, each said front face being inclined at one predetermined angle relative to a base plane parallel to the general direction of movement of the tape so that the spacing therebetween increases with distance from the gap; and

said casing having guide surface means training a tape for movement across each pole piece at a second predetermined angle less than said one predetermined angle relative to said base plane;

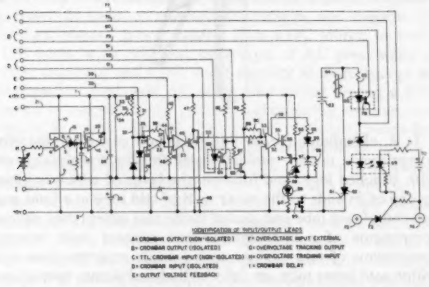
whereby the spacing between the tape and the front faces of the pole pieces increases smoothly and without abrupt discontinuity between the gap and the inner and outer ends of each of the respective front faces.

4,193,104

PROGRAMMABLE OVERVOLTAGE PROTECTOR

Sarkis Nercessian, Flushing, N.Y., assignor to Kepco, Inc., Flushing, N.Y.

Filed Dec. 28, 1977, Ser. No. 865,183
Int. Cl.[2] H02H *3/20*
U.S. Cl. 361—56 **11 Claims**



1. In a circuit adapted to crow-bar a power supply, the combination of;

a silicon controlled rectifier for crow-barring a power supply;

means for comparing the output voltage of the power supply to be crow-barred with a reference voltage and providing a crow-bar signal (in the presence of) responsive to an output voltage greater than said reference voltage by more than a predetermined (amount) voltage;

means for automatically tracking said reference voltage to maintain said predetermined voltage substantially constant in the presence of programmed changes in said output voltage;

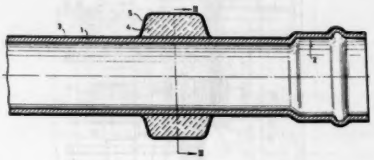
and an opto-coupler responsive to said signal coupled to said silicon controlled rectifier for firing said silicon controlled rectifier and thereby crow-barring the power supply.

4,193,105

PIPE WITH AN EXTERNAL SEALING BODY

Jurgen Graafmann, Ibbenburen, Fed. Rep. of Germany, assignor to Wavin B.V., Zwolle, Netherlands

Filed May 17, 1977, Ser. No. 797,864
Claims priority, application Netherlands, May 21, 1976, 7605520; Fed. Rep. of Germany, Nov. 26, 1976, 2653698
Int. Cl.[2] H05F *3/02*
U.S. Cl. 361—215 **8 Claims**



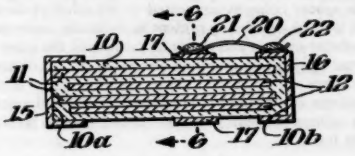
1. A thermoplastic pipe provided with an electrically conducting surface layer of thermosetting resin adhering to the thermoplastic pipe, and at least one resilient sealing body which has been foamed onto the electrically conducting surface layer, said sealing body containing electrically conducting particles.

4,193,106

MONOLITHIC CERAMIC CAPACITOR WITH FUSE LINK

James H. Coleman, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 24, 1978, Ser. No. 871,903
The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.
Int. Cl.[2] H01G *1/11*
U.S. Cl. 361—275 **3 Claims**



1. A Monolithic ceramic capacitor comprising a dielectric ceramic body; two alternate sets of interdigitated spaced parallel film electrodes buried in said body, mutually perpendicular X and Y axes of said capacitor defining a plane being parallel to said electrodes, one alternate set of said electrodes extending in one X axis direction to one end face of said body and being recessed within said body from the opposite end face, the other alternate set of said electrodes being recessed within said body from said two end faces and extending in at least one Y axis direction to at least one side face of said body in a region intermediate said end faces; a first termination layer being bonded to said one end face and contacting said one set of electrodes; a second termination layer being bonded to said side face and contacting said second set of electrodes, a third

termination being bonded to said opposite end face without contacting either of said electrode sets; two lead wires, one of said wires being connected to said first terminal layer and the other of said wires being connected to said third terminal layer; and a fuse link being connected between said second and third termination layers.

4,193,107

VARIABLE CAPACITOR

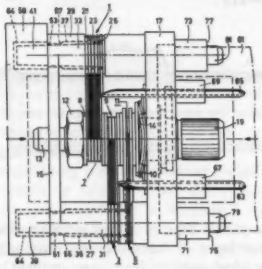
Adrianus J. Wagemakers; Johan C. J. A. Roozen, and Jozephus J. M. Smit, all of Tilburg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,272

Claims priority, application Netherlands, Mar. 8, 1977, 7702451

Int. Cl.[2] H01G *5/06*

U.S. Cl. 361—298 **12 Claims**



1. A variable capacitor comprising, a stator and a rotor which are clamped and arranged, respectively, between an upper plate composed of a synthetic material suitable for ultrasonic welding and a lower plate composed of a synthetic material suitable for ultrasonic welding, the upper plate and the lower plate being maintained at a distance from each other by a plurality of first and second spacer columns which are coaxially situated relative to each other and which extend transversely of the plane of the plates, said first and second spacer columns being formed to be integral with the upper and lower plates respectively, at least two of the spacer columns having an at least partly tubular construction for connection of the upper plate to the lower plate, a spacer column of one of the plates being inserted with clearance into the tubular part of one of the spacer columns connected to the other plate, an ultrasonic welded joint being present between the inner surface of the tubular column and the outer surface of the other column inserted therein with said joint being situated at a distance from an end face of the tubular column such that a part of the tubular column is subject to a compression force and a part of the other column projecting into the tubular column is subject to a tensile force.

4,193,108

APPARATUS FOR SECURELY FASTENING A CIRCUIT BOARD TO A CIRCUIT BOARD EDGE CONNECTOR

John V. Romano, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Aug. 2, 1978, Ser. No. 930,470

Int. Cl.[2] H02B *1/02*

U.S. Cl. 361—399 **25 Claims**

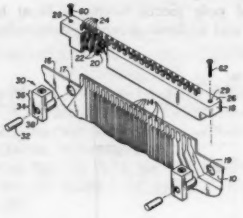
1. An apparatus for securing a circuit board edge connector to a circuit board, the circuit board having an opening proximate an edge thereof, said apparatus comprising:

a fastening member having a first portion, said first portion having a back surface, a mating surface adapted for engagement with the circuit board, and an aperture extending from said back surface to said mating surface; and an end portion having a wall oriented generally perpendicular to said mating surface;

means on said end portion for enabling said edge connector to be secured to said fastening member;

attaching means projecting from said mating surface of said first portion and insertable through the opening in the circuit board for enabling the fastening member to be loosely attached to the circuit board; and

means operable with said attaching means for expanding said



attaching means when inserted in the opening so as to enable the previously loosely attached fastening member to be rigidly secured to the circuit board, said wall of said end portion and said attaching means being spaced apart a predetermined distance so that said wall overlaps the circuit board edge when said attaching means is inserted in said opening so that said wall and said attaching means generate orthogonal gripping forces to the circuit board when said attaching means is expanded by said expanding means.

4,193,109

PERSONNEL MARKER DEVICE

William R. Heffernan, Westfield; Mary-Louise Vega, Califon, both of N.J., and Edward T. Rockwell, Sr., Leominster, Mass., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 22, 1978, Ser. No. 926,989

Int. Cl.[2] F21K *2/00*

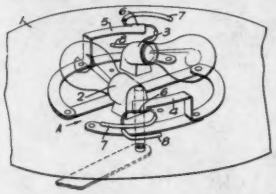
U.S. Cl. 362—34 **3 Claims**

1. A chemiluminescent lightstick and container therefor, comprising a unitary molded outer flexible translucent tube with attached lever and fulcram, the lever of which is joined by one of its ends to the outer wall of said tube at a joint near one end of said tube and, sealed inside said outer tubes, several components of a chemiluminescent mixture with separate components of said mixture sealed inside separate glass vials within said outer tube, an outer cylindrical sleeve open at one end and fitted snugly over the length of the outer wall of said tube by insertion of the free end of said tube through an open end of said sleeve, with a portion cut away from the wall of said sleeve at said open end, said cut away portion being of width only sufficient for said sleeve to pass said lever at said joint and of length only sufficient for said sleeve to slide past said joint to cover the full length of said tube except at said cut away portion.

4,193,110
LIGHT FIXTURES

Kolbjorn Olsen, Harstad, Norway, assignor to Bjorn Kokvik, Oslo, Norway

Filed Jun. 22, 1978, Ser. No. 918,031
Int. Cl.[2] F21P 5/00
U.S. Cl. 362—371 10 Claims

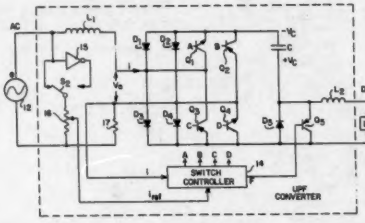


1. In a light fixture having securing means for a lamp globe, the improvement comprising at least two moveable members each having a first resilient arm which abuts the inside of the lamp globe in the area around an opening of the lamp globe, and a second resilient arm which abuts the inside of the opening of the lamp globe to releasably maintain the first arm in said abutment with the inside of the lamp globe whereby the lamp globe may be releasably secured to the light fixture.

4,193,111
UNITY POWER FACTOR CONVERTER

Gene W. Wester, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jun. 8, 1978, Ser. No. 913,888
Int. Cl.[2] H02M 7/70
U.S. Cl. 363—84 10 Claims

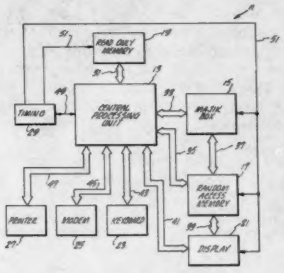


1. A unity power factor conversion circuit, capable of effecting either dc-to-ac or ac-to-dc conversion, and capable of providing bilateral power control from a DC source, or load, at DC ports to an AC load, or source, at AC ports using a storage capacitor and a full wave rectifier to store energy in said capacitor from said AC ports, said circuit having a first inductor to couple said AC ports to said capacitor and a second inductor to couple said DC ports to said capacitor, means for selectively switching at high speed said first inductor to $+V_c$ at a positive terminal of said capacitor, $-V_c$ at a negative terminal of said capacitor, or to zero volts at a point on the current return path of said AC source, or load, and means responsive to a comparison of the current i through said first inductor with a reference current i_{ref} proportional to and in a predetermined in phase or antiphase relationship with the voltage e of said AC source, or load, for controlling said high speed switching means to connect said first inductor to the positive or negative terminal of said storage capacitor, or to zero volts, depending upon whether i is greater or less than i_{ref}, and depending upon whether the voltage e is positive or negative, such that when e is positive, said first inductor is connected to zero volts if $i < i_{ref}$ and to the positive terminal of said capacitor if $i > i_{ref}$, and when e is negative, said first inductor is connected to zero volts when $i < i_{ref}$ and to the negative terminal of said capacitor if i<ref, whereby the AC source, or load, current i is forced to follow the voltage e.

4,193,112
MICROCOMPUTER DATA DISPLAY COMMUNICATION SYSTEM WITH A HARDWIRE EDITING PROCESSOR

Judson T. Gilbert, Hialeah; George R. Harrison; Alan R. Holbrook, both of Miami; Michael Levy, Pembroke Pines; John B. Scott, Miami Springs, and Harris K. Swan, Miami, all of Fla., assignors to Racal-Milgo, Inc., Miami, Fla.

Filed Jan. 22, 1976, Ser. No. 651,249
Int. Cl.[2] G06F 3/14, 9/00, 13/00
U.S. Cl. 364—200 22 Claims



1. In a data display terminal communication system having a keyboard input device communicating with a microprocessor means, a random access memory means communicating with the microprocessor means for storing character data to be displayed under control of said microprocessor means, and a display means for displaying characters represented by the character data in said random access memory means on a line-by-line basis in response to said microprocessor means transmitting a memory address and control signals to said display means, the improvement comprising: p1 means for removing character data from and inserting character data into said memory means in blocks of N characters, in between the times said microprocessor means transmits a memory address and control signals to said display means, the inserting and removing being in response to said microprocessor means transmitting a memory address and control signals to said character data removing and inserting means, said character data removing and inserting means including;

shift register means for storing character data removed from said memory means in a block of N characters, N being the number of characters capable of being displayed on one line of said display means;

means responsive to instruction codes and command signals from said microprocessor means for modifying the character data block in said shift register means as instructed by said microprocessor means; and

means responsive to control signals from said microprocessor means for inserting the character data block modified by the modifying means into said memory means at a location directed by the memory address transmitted to the display means by said microprocessor means.

4,193,113
KEYBOARD INTERRUPT METHOD AND APPARATUS

Mark F. Cykowski, Birmingham, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 582,272, May 30, 1975, abandoned.
This application Dec. 13, 1978, Ser. No. 969,112
Int. Cl.[2] G06F 3/02, 9/18
U.S. Cl. 364—200 1 Claim

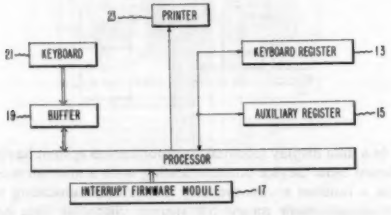
1. In a data processing system comprising a central processor

for executing keyboard and non-keyboard macro-instructions under firmware control, a keyboard, a keyboard buffer coupling said keyboard to said central processor, a keyboard register having a set of register locations altered by the execution of both keyboard and non-keyboard macro-instructions, a plurality of auxiliary registers and a plurality of temporary registers, each of said registers being coupled to said central processor, a method of interrupting the performance of a keyboard macro-instruction to allow the processing of other non-keyboard macro-instructions by transferring between the keyboard register, the temporary registers and the auxiliary registers the contents of said set of register locations in said keyboard register which are altered by both keyboard and non-keyboard macro-instruction to insure the proper information is stored in said set of register locations during the execution of both keyboard and non-keyboard macro-instructions, said method comprising the steps of:

(1) testing said keyboard buffer to ascertain whether entered data is present in said keyboard buffer;

(2) processing said entered data and repeating step (1) if said testing indicates the presence of entered data;

(3) transferring the contents of said set of register locations in said keyboard register to said temporary registers;



(4) transferring the contents of said auxiliary registers to said set of register locations in said keyboard register;

(5) transferring the contents of said temporary registers to said auxiliary registers;

(6) interrupting the processing of a keyboard macro-instruction to execute a non-keyboard macro-instruction;

(7) testing said keyboard buffer to ascertain whether data is present in said buffer;

(8) executing a succeeding non-keyboard macro-instruction and repeating step (7) if the testing indicates no entered data in said keyboard buffer;

(9) transferring the contents of said set of register locations in said keyboard register from said keyboard register to said temporary registers;

(10) transferring the contents of said auxiliary registers to said set of register locations in said keyboard register;

(11) transferring the contents of said temporary registers to said auxiliary registers;

(12) processing said data entered into said keyboard buffer; and

(13) continually repeating steps (1) through (12).

4,193,114

TICKET-ISSUING SYSTEM

Fernando Benini, Zola Predosa, Italy, assignor to CIR- S.p.A.-Divisione Sasib, Bologna, Italy

Filed Jun. 22, 1978, Ser. No. 918,283

Claims priority, application Italy, Jun. 30, 1977, 12665 A/77

Int. Cl.[2] **G06F** *3/02, 3/12, 3/14*

U.S. Cl. 364—200 **6 Claims**

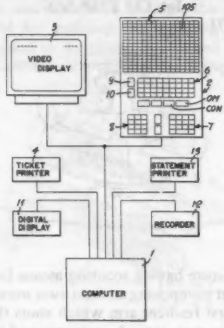
1. A system for issuing a ticket for travel to a selected destination having a name defined by a plurality of consecutive letters of the alphabet, comprising:

a programmed computer;

a ticket printer coupled to said computer;

a video display coupled to said computer for visually displaying at least the information required to define said selected destination; and

a keyboard panel coupled to said computer, said keyboard including an omission key and a set of alphabetical keys



each representing a letter of the alphabet, the name of said selected destination being introduced into said computer by depressing alphabetical keys to represent certain of the letters in the name of said destination and depressing said omission key to represent the remainder of said letters.

4,193,115

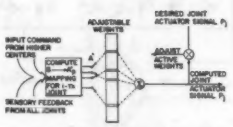
METHOD AND APPARATUS FOR IMPLEMENTATION OF THE CMAC MAPPING ALGORITHM

James S. Albus, Kensington, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 15, 1977, Ser. No. 860,799

Int. Cl.[2] **G06F** *9/06*

U.S. Cl. 364—300 **3 Claims**


INPUT COMMAND FROM HIGHER CENTERS
COMPUTE MAPPING FOR i-th JOINT
SENSORY FEEDBACK FROM ALL JOINTS
ADJUSTABLE WEIGHTS
DESIRED JOINT ACTUATOR SIGNAL
ADJUST ACTUATOR WEIGHTS
COMPUTED JOINT ACTUATOR SIGNAL

1. A machine implemented method of addressing, in dependence on an input signal comprising at least one variable S_i, a distributed storage memory in an adaptive control system wherein a set of control signal values is stored such that each of the stored values is distributed over a unique set A^*_p of K physical memory locations, more than one stored value may share an individual memory location a_j, and the degree of overlap between sets A^*_p corresponds to the degree of similarity between input signals, the method comprising the steps of: for each variable S_i:

(1) loading a first register having at least b+1 bits with the binary equivalent of the input variable S_i, where b represents the number of bits in the binary equivalent of the largest of the values which an input variable S_i may obtain;

(2) initializing a second register having q bits, where

$q=\log_2 K$, and the contents of the second register constitute the count of an index j;

(3) obtaining a value Q_{ij} by outputting the contents of the second register as the lowest order bits of the value Q_{ij}, and the contents of the $(b-q+1)$ bit locations of the first register as the highest order bits of the value Q_{ij};

(4) transferring all of the values Q_{ij} into a shift register having $N(b+1)$ bits such that the shift register contains the concatenation of the values Q_{ij};

(5) shifting the contents of the shift register into a cyclic shift register connected so as to produce a pseudorandom number as a result of the shifting of the contents thereof; thereby obtaining memory location a_j;

(6) changing the contents of the first and second registers by incrementing or decrementing the value thereof by by a factor of one;

(7) repeating for each variable S_i the sequence of steps (3)–(6) $(K-1)$ times, thereby obtaining all of the memory locations a in the set A^*_P.

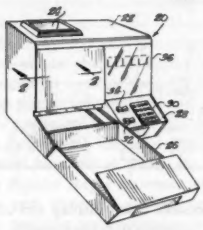
4,193,116
ANALYSIS INSTRUMENT

David B. Funk, Virden, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Continuation-in-part of Ser. No. 791,641, Apr. 27, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 890,502

Int. Cl.[2] G01R *27/26*

U.S. Cl. 364—556 **35 Claims**



1. An analysis instrument for measuring the contents of a sample of a material comprising: a test cell for receiving said sample, said test cell comprising a capacitor whose electrical properties are modified in accordance with the dielectric constant of the sample, which dielectric constant is a function of the contents thereof, circuit means including means for applying two electrical signals of different predetermined frequencies to said test cell, means for applying said two electrical signals to said test cell when said test cell is empty and for again applying said two electrical signals to said test cell when said sample is received therein, test circuit means including said capacitor for receiving said applied signals and for producing test signals in response to said applied electrical signals, said test signals corresponding to said dielectric constant of said material, said circuit means further including measurement circuits for receiving said test signals and providing an indication corresponding to said contents of said material in accordance with said test signals.

4,193,117
ELECTRONIC CORRELATOR

Werner Marckwardt, Jena-Lobeda, German Democratic Rep., assignor to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed May 22, 1978, Ser. No. 908,363

Claims priority, application German Democratic Rep., May 31, 1977, 199212

Int. Cl.[2] G06F *15/34*; G06G *7/19*

U.S. Cl. 364—728 **1 Claim**

1. An electronic correlator for correlating electric signals derived from homologous image points of stereo-couples of photographs, particularly for use in stereoplotters, comprising

a correlator unit having two inputs and one output,

an auto-correlator unit having two inputs and one output,

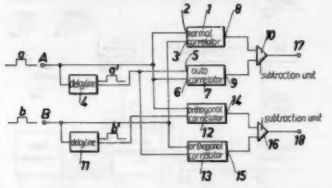
two orthogonal correlator units having two inputs and one output,

two delay-lines, and

two subtraction units,

said correlator unit receiving the non-delayed signals from one of said homologous image points of each photograph of said stereo-couple,

said auto-correlator unit receiving at one of its outputs a non-delayed signal from the first of said photographs of the stereo-couple, the output of said correlator unit and the output of said auto-correlator unit being connected to one of said two subtraction units,



the first of said orthogonal correlator units receiving at one of its inputs the non-delayed signal from the first photograph of said stereo-couple and being connected to the second of said delay lines via its other input for receiving the non-delayed signal from the second photograph of said stereo-couple,

the second of said orthogonal correlator units receiving the non-delayed signal from the second photograph of said stereo-couples at one of its inputs, and being connected to the first of said delay lines via the other input,

said other input receiving the delayed signal from the first photograph of said stereo-couple, the outputs of said two orthogonal correlator units being connected to the other of said two subtraction units.

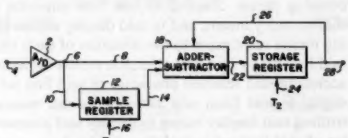
4,193,118
LOW PASS DIGITAL AVERAGING FILTER

Harold G. Nash, Tempe, Ariz., and John R. Linford, Broomfield, Colo., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1978, Ser. No. 925,719

Int. Cl.[2] G06F *7/38*

U.S. Cl. 364—734 **9 Claims**



1. An apparatus for establishing a running average for a sequence of digital signals, comprising:

a. first means for receiving a plurality of input digital signals during a corresponding plurality of sequential sample periods;

b. second means coupled to said first means for storing a predetermined number N of the input digital signals, said second means also being for storing an input digital signal received during a present sample period and providing an output digital signal corresponding to an input digital signal received N sample periods prior to the present sample period;

c. third means for storing an average digital signal; and

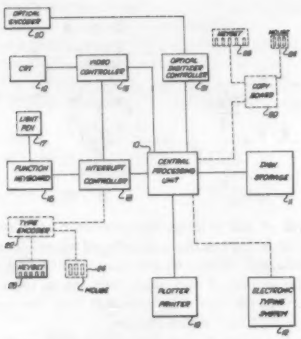
d. an arithmetic means coupled to said first means, to said second means and to said third means for adding the input digital signal received during the present sample period to the average digital signal and for subtracting the output digital signal from the average digital signal for updating the average digital signal stored by said third means.

4,193,119

APPARATUS FOR ASSISTING IN THE TRANSPOSITION OF FOREIGN LANGUAGE TEXT

Shingo Arase, Monterey Park, Calif., and Roy J. Lahr, Fairfield, Conn., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,266
Int. Cl.[2] G06F *15/38*
U.S. Cl. 364—900 **21 Claims**



1. Apparatus for generating a text of information in a language form comprised of first and second sets of characters, wherein each character or group of characters of said first set bears a predetermined phonetic or semantic relationship to a character or group of characters of said second set, said apparatus comprising:

memory means for storing in a binary digital format each of the first and second sets of characters comprising said language form;

first selection means for selecting individual ones of said first set of characters for inclusion in the text of information being generated; display means including a first display area for displaying the text of information being generated and a second display aread for displaying predetermined ones of said second set of characters;

processing means coupled to said first selection means, to said memory means, and to said display means and including means responsive to the selection of each character of said first set by said first selection means for automatically accessing said selected character of said first set in binary digital format from said memory means, means for controlling said display means to display said accessed character of said first set in said first display area as part of said text of information, means responsive to the selection of each character or group of characters of said first set that bears said predetermined phonetic or semantic relationship to a character or group of characters of said second set for automatically accessing said character or group of characters of said second set in binary digital format from said memory means, and means for controlling said display means to display said accessed character or group of characters of said second set in said second display area;

second selection means for selecting a desired character or group of characters of said second set displayed in said second display area for substitution in said text of information in place of said selected character or group of characters of said first set that bears said predetermined phonetic or semantic relationship toward said selected character or group of characters of said second set; and

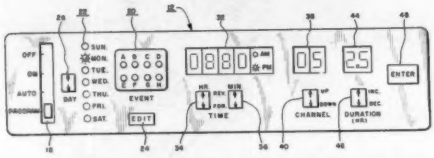
said processing means is coupled to said second selection means and further includes means responsive to the selected character or group of characters of said second set for automatically substituting said selected character or group of characters of said second set for the selected character or group of characters of said first set by controlling said display means to display said selected character or group of characters of said second set in place of said selected character or group of characters of said first set in said text of information displayed in said first display area.

4,193,120

ADDRESSABLE EVENT DISPLAY AND CONTROL SYSTEM

Joseph F. Yello, Wooddale, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 13, 1978, Ser. No. 942,091
Int. Cl.[2] H04N *5/76*; G06F *9/10*
U.S. Cl. 364—900 **9 Claims**



1. An addressable event display and control system for use with a clock controlled programmable memory having the capability of storing a multitude of time related program events, which events are utilized, chronologically, for controlling a video frequency recorder, the content of each said event comprising a plurality of pieces of information, said event display and control system comprising:

an array of light-emitting devices coupled to the memory, each of said devices constituting an event designator and signifying, when energized, storage of a programmed event in the memory;

a bank of light-emitting day-of-the-week indicators also coupled to the memory, as well as to said array, and selectively energizable to visually identify a particular day;

means for selecting a particular one of said day indicators;

means responsive to selection of said particular day indicator for interrogating said array of event designators to ascertain which of said designators have been programmed for said particular day;

means for selecting a desired one of said event designators for said particular day to afford review of the program content of said selected event designator;

visual signaling means, responsive to said designator selecting means, for identifying said selected event designator;

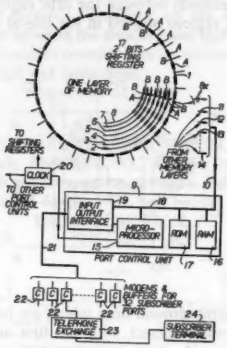
programming means, including visual readout means, for selecting and visually displaying the time, channel and recording duration information that identifies an event to be associated with said selected event designator; and

means for entering said program information into the memory for subsequent retrieval upon said selected day to control the recorder.

4,193,121
INFORMATION HANDLING APPARATUS HAVING MULTIPLE PORTS DISTRIBUTED AROUND SHIFTING REGISTER RINGS

Samuel Fedida, and Desmond J. Sargent, both of Felixstowe, England, assignors to Post Office, London, England

Filed Jul. 12, 1977, Ser. No. 814,921
Claims priority, application United Kingdom, Jul. 16, 1976, 29739/76
Int. Cl.[2] G06F *13/02, 3/00*
U.S. Cl. 364—900 7 Claims



1. An information handling apparatus including a plurality of ports, each for receiving input signals and transmitting corresponding output signals, a plurality of port control units, each of which is connected to at least one of said ports, and information storage means connected to all of the port control units, the information storage means including several pluralities of closed rings formed of groups of shifting register stages connected in series, each ring having the same number of stages and having a plurality of junctions at which the last stage of one group of shifting register stages is connected directly to the first stage of the next group of shifting register stages around the particular ring, the port control units being connected directly to respective corresponding junctions in each plurality of rings, and stepping means for synchronously and continuously recirculating information around the rings, the information consisting of groups of digits, the digits of each group being respectively stored in the rings of a plurality of rings and propagated in parallel by the stepping means so as to appear in parallel at corresponding junctions of the particular plurality of rings, and each port control unit being connected to the stepping means and to all of the rings and including means enabling it to read a selected group of digits in parallel by accessing the corresponding junctions on the rings at an instant associated with the selected group of digits, and by selecting one of the pluralities from among the several pluralities.

4,193,122
CONNECTING LINE GENERATOR

John J. Bowers, Medina, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

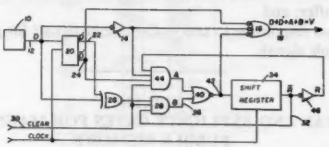
Filed Nov. 28, 1977, Ser. No. 855,128
Int. Cl.[2] G06F *3/14*; G08B *23/00*
U.S. Cl. 364—900 8 Claims

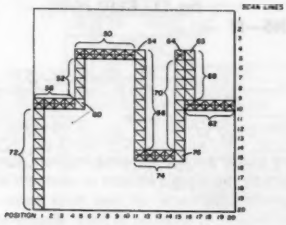
1. A system for interpolating data for use in display devices, said system comprising:

means for receiving a set of data comprising a plurality of scan lines one scan line at a time, wherein each scan line may include one or more lines of data;

means operatively connected to said receiving means for determining the ends of said lines of data within said scan lines and for producing signals indicative to said ends of said lines of data;

means operatively connected to the output of said determining means for storing said signals indicative of said ends of said lines of data, wherein the output of said storing means is operatively connected to said determining means to cause said determining means to repeatedly insert in the following scan lines signals indicative of said ends of data from preceding lines of data from preceding scan lines until a subsequent end of data signal is determined in a subsequent scan line;





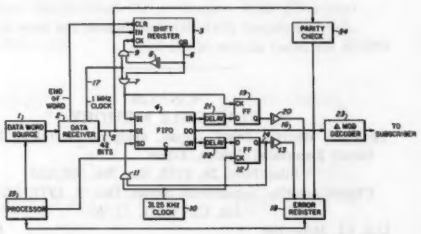
means operatively connected to both said receiving means and the output of said determining means for producing an output indicative of both said lines of data received and said inserted signals from said determining means such that at least one of said lines of data within one scan line is connected to at least one of said lines of data within a different scan line; and

display means connected to said producing means for displaying the output of said producing means.

4,193,123
FAULT DETECTION IN DATA RATE CONVERSION SYSTEMS USING A FIRST-IN, FIRST-OUT BUFFER

James M. Meinke, Lisle, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1978, Ser. No. 888,345
Int. Cl.[2] G06F *11/00*
U.S. Cl. 364—900 6 Claims



1. A fault detection arrangement comprising:

a digital word source for generating n bit digital words at the rate of one such digital word every m microseconds;

a first-in, first-out buffer comprising means responsive to the

storage condition of said first-in, first-out buffer for generating buffer-empty signals and alternatively buffer-not-empty signals;

means for storing digital words from said digital word source in said first-in, first-out buffer at the rate of one digital word every m microseconds;

means responsive to said buffer-not-empty signals for reading bits from said first-in, first-out buffer memory at the rate of one bit per m/n microseconds, said means for reading being activated a predetermined period of time after at least one bit has been stored in said first-in, first-out buffer; and

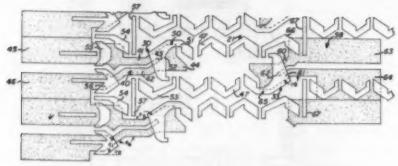
means responsive to said buffer empty signals for generating fault signals.

4,193,124

SWAP AND REPLICATE GATES FOR MAGNETIC BUBBLE MEMORY

David C. Bullock, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 20, 1978, Ser. No. 888,124
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—12 **9 Claims**



7. In a magnetic bubble memory arrangement having a planar layer of magnetic material in which magnetic bubbles can be moved and a plurality of bubble propagation elements of magnetically soft material disposed on said planar magnetic layer and defining a bubble propagation path in the form of a loop, a transfer/replicate bubble propagation path component of magnetically soft material disposed on said planar magnetic layer, said component comprising:

an asymmetric hook-like transfer/replicate element forming a bight at one end of the loop,

the opposite ends of said hook-like element being respectively disposed in the opposite courses of the loop,

said hook-like element including a wedge-shaped bight portion disposed between the opposite courses of the loop and tapering toward the leading end of said hook-like element so as to have a reduced width dimension at the leading end thereof, and an asymmetric chevron-shaped portion integral with said wedge-shaped bight portion and forming an extension of one course of the loop, and

the leading end of said hook-like element being disposed outwardly with respect to the end of said asymmetric chevron-shaped portion in relation to the loop at the end of the other course of the loop.

4,193,125

READ ONLY MEMORY

Yoshiaki Moriya, Inagi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 28, 1978, Ser. No. 964,430
Claims priority, application Japan, Dec. 2, 1977, 52/144871
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—104 **9 Claims**

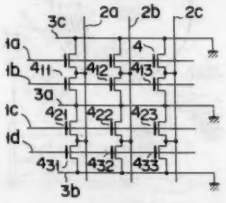
6. A read only memory having a semiconductor substrate of one conductivity type and a plurality of MOS transistor blocks formed on one major surface of the semiconductor substrate, each of said MOS transistor blocks comprising:

first, second, third and fourth regions of the opposite conductivity type which are formed at four corners of an imaginary rectangle;

a fifth region of the opposite conductivity type which is formed substantially at the center of the imaginary rectangle and spaced from the first, second, third and fourth regions;

a first gate conductor which is laid on a gate insulation layer and extends between the fifth region and the first and second regions aligned in the lateral direction of the substrate;

a second gate conductor which is laid on the gate insulation layer and extends between the fifth region and the third and fourth regions aligned in the lateral direction of the substrate;



a group of output-ground lines which are laid on an insulation layer and intersect with the first and second gate conductors, said group including a first output-ground line having first and third contacts connected to the first and third regions, respectively, a second output-ground line having second and fourth contacts connected to the second and fourth regions, respectively and a third output-ground line having a fifth contact connected to the fifth region; and

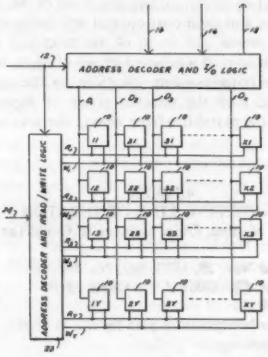
suppression layers of the same conductivity type as the substrate which are formed selectively on the surface portions of the substrate between the fifth region and the first, second, third and fourth regions.

4,193,126

I^2L RAM UNIT

Kent F. Smith, Salt Lake City, Utah, assignor to General Instrument Corporation, Clifton, N.J.

Filed Dec. 4, 1978, Ser. No. 966,020
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—174 **13 Claims**



1. A memory unit for use in a memory circuit of the type having a power source, a data input/output line, a read line and a write line, said unit comprising a given number of inverter transistors, each having a base terminal, an emitter terminal

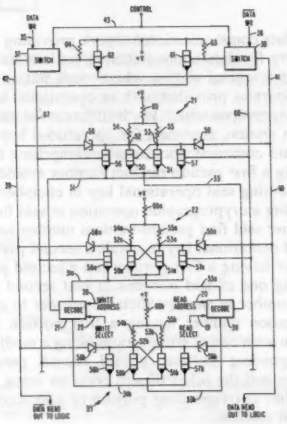
operably connected to ground, and one or more collector terminals and said given number of injector transistors, each having a base terminal operably connected to ground, an emitter terminal operably connected to the power source and a collector terminal operably connected to the base terminal of a different one of said inverter transistors, respectively, means for cross-coupling a first and a second of said inverter transistors to form a flip-flop configuration, the state of said flip-flop being determined by the data stored therein and means operably interposed between and operably connected to the read, write and data lines, on the one hand, and said cross-coupled first and second inverter transistors, on the other hand, to control data flow between the data line and said cross-coupled first and second inverter transistors in accordance with signals applied on the read and write lines.

4,193,127

SIMULTANEOUS READ/WRITE CELL

John E. Gersbach, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1979, Ser. No. 58
Int. Cl.² G11C *11/40*
U.S. Cl. 365—174 **12 Claims**



2. A memory array of information storage cells having first and second orthogonal axis comprising,

a plurality of storage cells, each of said cells comprising a cross coupled transistor pair, read control circuit means, write control circuit means, read bit means and write bit means, each of said means being connected independently of the others to said cell,

said read control circuit means including a decoder for selecting a first set of cells along said first axis for the reading of information from said first set of cells,

said write control circuit means including a decoder for selecting a second set of cells along said first axis for the writing of information into said second set of cells,

said read bit means being coupled to a third set of cells along said second axis for retrieving information read from one cell of said first set of cells,

said third set of ceils including one cell from said first set of cells and one cell from said second set of cells,

said write bit means being coupled to said third set of cells along said second axis for writing information into one cell of said second set of cells and

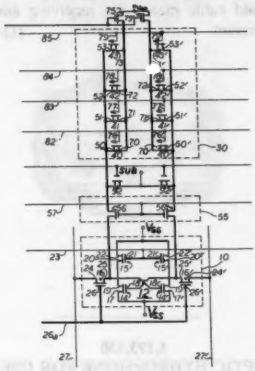
means coupling said read bit means to said write bit means whereby said information read from said one cell of said first set of cells is simultaneously written into said one cell of said second set of cells.

4,193,128

HIGH-DENSITY MEMORY WITH NON-VOLATILE STORAGE ARRAY

Joe E. Brewer, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1978, Ser. No. 911,266
Int. Cl.² G11C *11/40*
U.S. Cl. 365—228 **8 Claims**



1. A composite memory array for storing binary words in a volatile state in response to control signals on complementary bit lines and word lines and for selectively storing binary words in a non-volatile state in response to control signals on row lines, said composite memory array comprising:

a pair of access transistors that are respectively connected to the complementary bit lines and that are connected to a word line;

a flip-flop circuit connected to the access transistors for storing binary data signals from the complementary bit lines in a volatile state in response to control signals provided to the word lines; and

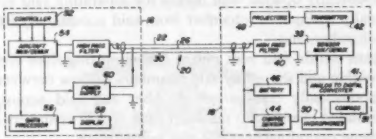
an array of non-volatile memory cells connected to the flip-flot circuit and to a plurality of row lines, said non-volatile array storing binary data signals from the flip-flop circuit at a selected non-volatile memory level in response to control signals selectively provided to the row lines.

4,193,129

CHARGING CIRCUIT FOR SONAR SYSTEMS

Robert W. Wiggins, Hatboro, Pa.; Kurt L. Ettenhofer, Valencia, Calif., and Jack Bess, Willow Grove, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 5, 1976, Ser. No. 645,868
Int. Cl.² G01S *9/66*
U.S. Cl. 367—106 **21 Claims**



1. A rechargeable dipped sonar system for an above-water vehicle, comprising, in combination:

cable means formed to depend from the vehicle for immersion in the water; first bi-directional data transfer means formed to be mounted within the vehicle and electrically

connected to one end of said cable means for receiving and transmitting data;

second bi-directional data transfer means electrically connected to the other end of said cable means for receiving and transmitting said data;

energy producing means formed to be mounted within the vehicle and electrically connected to said one end of said cable means for generating a charge current thereon; and

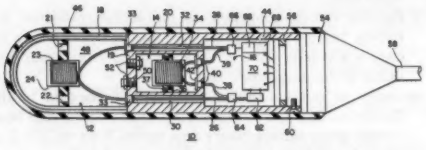
energy storage means electrically connected to said other end of said cable means for receiving and storing the charge current.

4,193,130

FIBER OPTIC HYDROPHONE FOR USE AS AN UNDERWATER ELECTROACOUSTIC STANDARD

A. Mark Young, Winter Park; Theodore A. Henriquez, and Allan C. Tims, both of Orlando, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1978, Ser. No. 940,550
Int. Cl.[2] H04R *23/00*
U.S. Cl. 367—149 **7 Claims**



1. An acousto-optical, hydrostatic pressure and temperature-stable hydrophone comprising:

optical fiber, acoustical energy sensor means assembled within an acoustically transparent chamber;

optical fiber, acoustical energy reference means assembled within an acoustically isolated chamber in axial alignment with said acoustically transparent chamber,

said acoustically transparent chamber and said acoustically isolated chamber including a fluid medium filling the space therein and having an acoustic impedance substantially the same as that of a medium in which said hydrophone is to operate;

acoustically opaque wall means for separating said acoustically transparent chamber from said acoustically isolated chamber; and

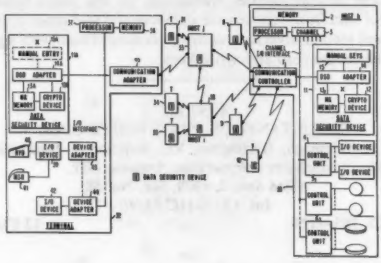
means within said wall means for permitting fluid confined within and shared by said chambers to flow between said acoustically transparent chamber and said acoustically isolated chamber to maintain each of said chambers at the same operating pressure and temperature.

4,193,131

CRYPTOGRAPHIC VERIFICATION OF OPERATIONAL KEYS USED IN COMMUNICATION NETWORKS

Richard E. Lennon, Woodstock; Stephen M. Matyas, Poughkeepsie; Carl H. W. Meyer, Kingston; Jonathan Oseas, Hurley; Paul N. Prentice, Hyde Park, and Walter L. Tuchman, Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,546
Int. Cl.[2] H04L *9/00*
U.S. Cl. 375—2 **11 Claims**



1. In a data communication network providing communication security for data communication sessions between a first station and a second station where each station has cryptographic apparatus provided with an operational key for cryptographic operations which key is different for each said communication session, a process for operational key verification for each said communication session comprising the steps of:

providing a first pseudo-random number at said first station representing said operational key in enciphered form,

performing a cryptographic operation at said first station to encipher said first pseudo-random number under control of said operational key to obtain a second pseudo-random number having a first portion and a second portion,

modifying one of said portions of said second pseudo-random number in an unpredictable manner to obtain a first verification number having a first portion and second portion with one of said portions being a modification of a corresponding portion of said second pseudo-random number and the other of said portions being identical to the other corresponding portion of said second pseudo-random number,

enciphering said first verification number under control of said operational key at said first station for transmission to said second station,

deciphering said enciphered first verification number under control of said operational key at said second station to provide a second verification number having a first portion and a second portion corresponding to said first and second portions of said first verification number,

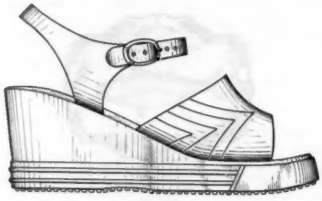
inverting one of said portions of said second verification number at said second station to provide a modified second verification number,

enciphering said modified second verification number under control of said operational key at said second station for transmission to said first station, and

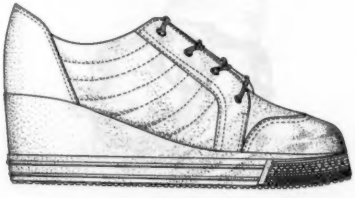
performing an operation at said first station in accordance with said first verification number and said enciphered modified second verification number to verify that said second station is the source of the cipher transmission to said first station only if said operational key at said first station is identical to said operational key at said second station.

254,396
FLAT FRANKFURTER
Arthur W. Carlson, 4321 S. Shirley La., Salt Lake City, Utah 84117
Filed Mar. 13, 1978, Ser. No. 886,175
Term of patent 3½ years
Int. Cl. D01—*04*
U.S. Cl. D1—26

254,397
OPEN TOE WEDGIE SNEAKER
Norman H. Finn, Waban, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Nov. 2, 1977, Ser. No. 848,377
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—296



254,398
WEDGIE SNEAKER
Norman H. Finn, Waban, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Feb. 7, 1978, Ser. No. 875,947
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—286



254,399
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,611
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

254,400
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,612
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

254,401
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,613
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

254,402
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,615
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

254,403
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,616
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

254,404
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,619
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

254,405
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,620
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

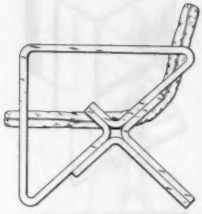
254,406
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,621
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

254,407
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,622
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

254,408
BELT BUCKLE
Ryk V. Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,623
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

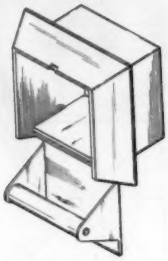
254,409
SEAT FOR BABY SWING
Robert L. Borucki, Jenkintown, Pa., assignor to Graco Metal Products, Inc., Elverson, Pa.
Filed Jan. 27, 1978, Ser. No. 872,897
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—10

254,410
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 677,623, Apr. 16, 1976, which is a division of Ser. No. 677,622, Apr. 16, 1976, which is a division of Ser. No. 677,617, Apr. 16, 1976. This application Feb. 22, 1978, Ser. No. 889,512
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

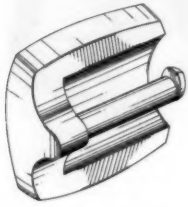


254,411
CHAIR
Henry Olko, Chicken Valley Rd., Locust Valley, N.Y. 11560
Filed Oct. 31, 1977, Ser. No. 847,117
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

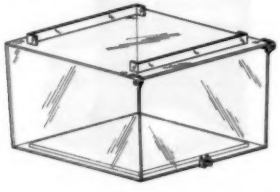
254,412
CABINET FOR HOLDING A ROLL OF TOILET PAPER
Kenneth F. Knight, 3125 Glen Garden Dr., N., Ft. Worth, Tex. 76119
Filed Sep. 22, 1978, Ser. No. 944,925
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—97



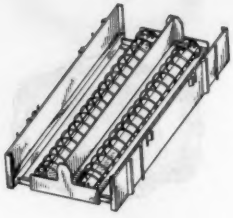
254,413
HOLDER FOR ROLLED PAPER
Dan L. Pool, 5524 N. 39th Ave., Phoenix, Ariz. 85019
Filed Sep. 21, 1978, Ser. No. 944,627
Term of patent 14 years
Int. Cl. D20—*02*; D23—*02*
U.S. Cl. D6—97



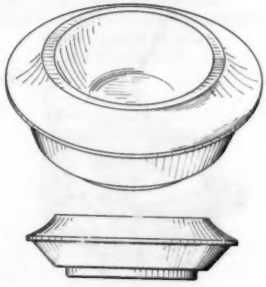
254,414
DISPLAY CASE
Dennis A. Gajewski, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.
Filed Dec. 5, 1977, Ser. No. 857,376
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*; D9—*03*
U.S. Cl. D6—172



254,415
MODULAR WIDTH ADJUSTABLE, SPRING FED DISPLAY DISPENSING ELEMENT
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Aug. 1, 1977, Ser. No. 821,050
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



254,416
INSULATED BOWL
Jack Abbate, Brooklyn, N.Y., assignor to Regency Service Carts, Inc., Brooklyn, N.Y.
Filed Oct. 25, 1977, Ser. No. 844,697
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—22



254,417
DETACHABLE HANDLE FOR A BEVERAGE CAN OR THE LIKE

Robert A. DeMars, 7328 Alabama Ave., Canoga Park, Calif. 91308, and John D. Thor, 23944 Nomar St., Woodland Hills, Calif. 91367

Filed Sep. 23, 1977, Ser. No. 836,226
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

254,418
PAINT STIRRING PADDLE

Lowell G. Norenberg, 12301 El Dorado Ave., Sylmar, Calif. 91342

Filed Apr. 24, 1978, Ser. No. 899,367
Term of patent 14 years
Int. Cl. D7—*99*; D8—*05*
U.S. Cl. D7—102

254,419
COMBINED OPENER AND HANDLE FOR A BEVERAGE CAN

Robert A. DeMars, 7328 Alabama Ave., Canoga Park, Calif. 91303, and John D. Thor, 23944 Nomar St., Woodland Hills, Calif. 91367

Filed Mar. 13, 1978, Ser. No. 885,689
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—34

254,420
HAIRDRESSER'S SCISSORS

Olof F. Bäckström, Tammisaari, Finland, assignor to Oy Fiskars AB, Helsinki, Finland

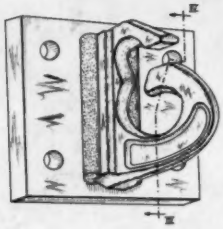
Filed Jun. 7, 1977, Ser. No. 804,406
Claims priority, application Finland, Dec. 9, 1976, 76701
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

254,421
NAIL SCISSORS

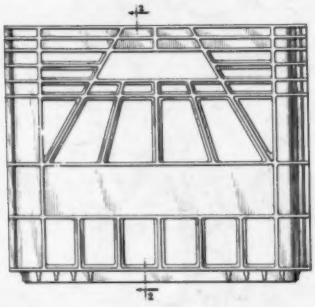
Olof F. Bäckström, Tammisaari, Finland, assignor to Oy Fiskars AB, Helsinki, Finland

Filed Jun. 7, 1977, Ser. No. 804,407
Claims priority, application Finland, Dec. 9, 1976, 76702
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

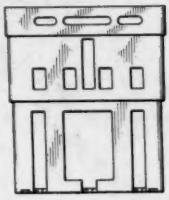
254,422
COMBINED HOOK AND ANCHORAGE PLATE
Lars O. A. Fredriksson, Växjö, Sweden, assignor to K A Bergs Smide AB, Gelma, Sweden
Filed Aug. 20, 1976, Ser. No. 716,192
Claims priority, application Sweden, Mar. 8, 1976, 760519
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367



254,423
BOTTLE CRATE
John D. Van Geem, Erie, Pa., assignor to Erie Crate and Manufacturing Company, Erie, Pa.
Filed Apr. 22, 1977, Ser. No. 789,964
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



254,424
NESTABLE SHIPPING CONTAINER
William H. Fredrick, 10455 Camarillo, North Hollywood, Calif. 91602
Filed Aug. 22, 1977, Ser. No. 826,320
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—246

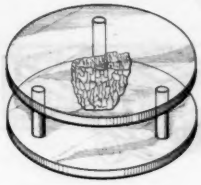


254,425
DIAL INDICATOR
Shingo Nishina, and Tokuzo Nakaoki, both of Kawasaki, Japan, assignors to Mitutoyo Mfg., Co., Ltd., Tokyo, Japan
Filed Feb. 1, 1978, Ser. No. 874,544
Claims priority, application Japan, Aug. 3, 1977, 52-030578
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

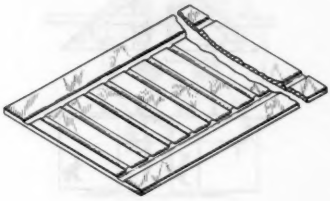
254,426
SCALE
Robert Perrier, Paris, France, assignor to Testut-Aequitas, Paris, France
Filed Jan. 3, 1978, Ser. No. 866,247
Claims priority, application France, Jul. 5, 1977, 77 75818
Term of patent 14 years
Int. Cl. D0—*04*
U.S. Cl. D10—91

254,427
SCALE
Robert Perrier, Paris, France, assignor to Testut-Aequitas, Paris, France
Filed Jan. 3, 1978, Ser. No. 866,605
Claims priority, application France, Jul. 5, 1977, 77 75818
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

254,428
DESK ORNAMENT OR SIMILAR ARTICLE
Mark A. Lasowski, 14501 Torrence, Burnham, and Richard Lasowski, 13247 S. Commercial, Chicago, both of Ill. 60633
Filed Sep. 12, 1977, Ser. No. 832,545
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



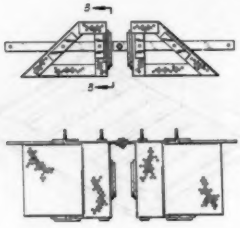
254,429
CONVEYOR BELT
Frank B. Summers, Jr., Marblehead, Mass., assignor to Fabreeka Products Company, Boston, Mass.
Filed Oct. 25, 1977, Ser. No. 844,705
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



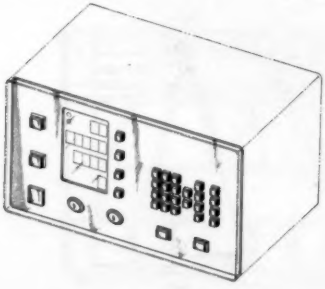
254,430
CATAMARAN WIND VANE
James M. Coffey, 320 E. Walnut Ave., El Segundo, Calif. 90245
Filed Feb. 24, 1978, Ser. No. 881,074
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—70

254,431
UTILITY VEHICLE
Roy F. Broyhill; James Parsons, both of Dakota City, Nebr.; Ralph Schroeder, Sioux City, Iowa, and Clarence E. Stewart, South Sioux City, Nebr., assignors to The Broyhill Manufacturing Company, Wayne, Nebr.
Filed Sep. 14, 1977, Ser. No. 833,236
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—97

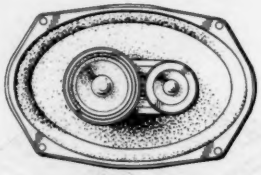
254,432
WHEEL CHOCK UNIT
Ronald G. Schessl, P.O. Box 1593, Edmond, Okla. 73034
Filed Feb. 6, 1978, Ser. No. 875,605
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—217

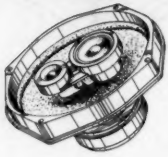


254,433
BENDING PRESS GAUGE CONTROL PANEL
Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Company, Inc., Indianapolis, Ind.
Filed Feb. 27, 1978, Ser. No. 881,874
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



254,434
LOUDSPEAKER
Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1978, Ser. No. 959,200
Claims priority, application Japan, May 10, 1978, 53-19181
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30





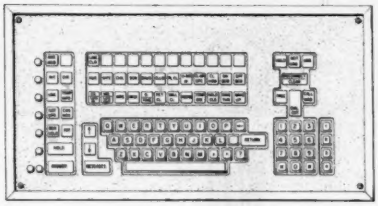
254,435
HOUSING FOR A TELEPHONE SET
James R. Ferron, Warsaw, N.Y., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Nov. 9, 1977, Ser. No. 849,832
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

254,436

SWITCHBOARD CONSOLE FOR A TELECOMMUNICATIONS SYSTEM

Peter A. Bakal, 39 Wallace St., Scotia, N.Y. 12302

Filed Aug. 8, 1977, Ser. No. 822,757
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

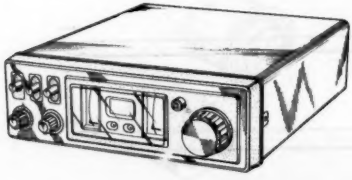


254,437

MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER

Kikuo Ohta, Katano; Kunio Hoshino, Kadoma, and Tsutomu Murakami, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oaza-Kadoma, Japan

Filed Jul. 20, 1977, Ser. No. 817,286
Claims priority, application Japan, Jan. 20, 1977, 52-1482
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



254,438

MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER

Kunio Hoshino, Kadoma, and Kikuo Ohta, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Inc., Kadoma, Japan

Filed Jul. 20, 1977, Ser. No. 817,291
Claims priority, application Japan, Jan. 20, 1977, 52-1480
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

254,439

TOY CHEST

John R. Nottingham, 2997 Washington Blvd., Cleveland Heights, Ohio 44118, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106

Filed Aug. 22, 1977, Ser. No. 826,883
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—121

254,440

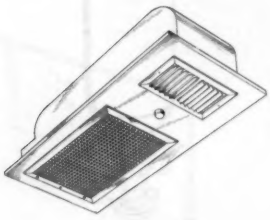
GAME CLUB WITH UNITARY HANDLE

Carl W. Reinhard, La Canada, Calif., assignor to Bataca, Inc., La Canada, Calif.

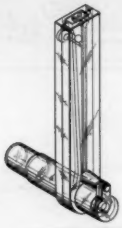
Filed Sep. 20, 1977, Ser. No. 835,040
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—211

254,441
WATER DISTILLER
Kenneth D. Lemoine, Box 476, Gravette, Ark. 72736
Filed Jun. 2, 1977, Ser. No. 802,360
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

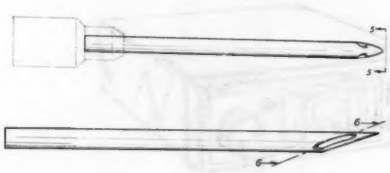
254,442
AIR CLEANER
David P. Cervone, 89 Indianola Rd., Youngstown, Ohio 44542
Filed Sep. 26, 1977, Ser. No. 836,548
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



254,443
PEAK EXPIRATORY FLOW METER OR SIMILAR ARTICLE
Jim M. Adams, Mt. Pleasant, S.C., assignor to Projects in Health, Inc., Princeton, N.J.
Filed Jan. 26, 1978, Ser. No. 872,699
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



254,444
BLOOD SAMPLING NEEDLE
Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437
Filed Sep. 1, 1977, Ser. No. 829,850
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54



254,445

CHROMATOGRAPHY COLUMN

Robert A. Boghosian, Parsippany, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 25, 1977, Ser. No. 827,754
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D24—56

254,446

BLOOD GAS SYRINGE STOPPER

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Keene, N.H.

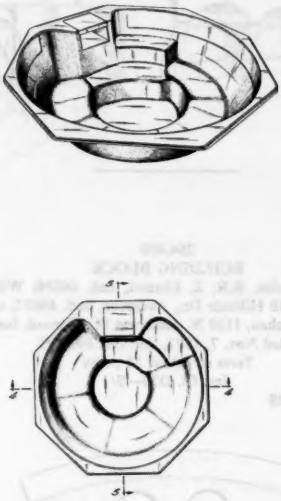
Continuation-in-part of Ser. No. 701,609, Jul. 6, 1976, Pat. No. D. 248,873. This application Apr. 14, 1978, Ser. No. 896,328
The portion of the term of this patent subsequent to Aug. 8, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

254,447

HYDROTHERAPY SPA

Richard G. Reineman, Newport Beach, Calif., assignor to Marlin Fiberglass, Huntington Beach, Calif.

Continuation-in-part of Ser. No. 5,911, Jan. 23, 1979, abandoned. This application Jun. 11, 1979, Ser. No. 47,274
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



254,448

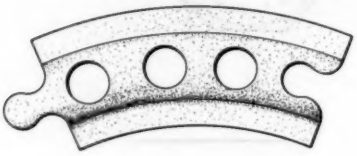
SHELTER

Richard Dattner, 180 Cabrini Blvd., New York, N.Y. 10033

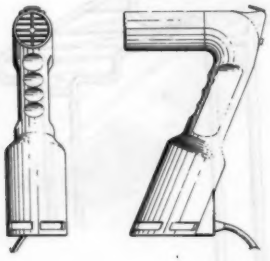
Filed Jan. 13, 1978, Ser. No. 869,202
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—18

254,449
BUILDING
Peter J. Doukas, 2230 Harford Ct., Waldorf, Md. 20601
Filed Jun. 15, 1977, Ser. No. 806,662
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33

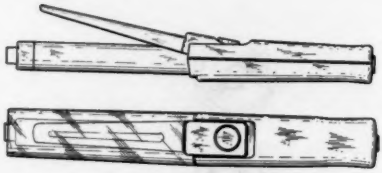
254,450
BUILDING BLOCK
Herschel F. Pulse, R.R. 2, Elwood, Ind. 46036; William F. McSherry, 810 Hillside Dr., Anderson, Ind. 46012, and Forrest E. McMahan, 1110 N. Anderson St., Elwood, Ind. 46036
Filed Nov. 7, 1977, Ser. No. 849,091
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—89



254,451
HAND HELD HAIR DRYER
Anthony Battaglia, 455 NW. 202nd Ter., Miami, Fla. 33100
Filed Sep. 16, 1977, Ser. No. 834,142
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

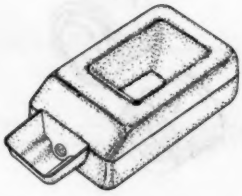


254,452
CURLING IRON
William J. Rakocy, Nutley, N.J., and Howard L. Rauch, Brooklyn, N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 7, 1977, Ser. No. 858,367
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



254,453
PET FOUNTAIN
Robert W. Strong, 219 Clinton Ave., Brooklyn, N.Y. 11205
Filed Aug. 23, 1978, Ser. No. 935,954
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

254,454
COMBINED FEEDER AND WATERER FOR PETS
George D. Clugston, R.R. #3, Box 203, Pittsburg, Kans. 66762
Filed Oct. 30, 1978, Ser. No. 956,255
Term of patent 14 years
Int. Cl.[2] D30—*03*
U.S. Cl. D30—16

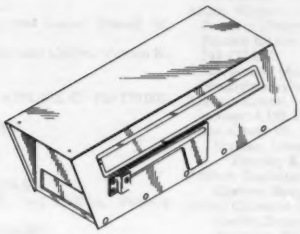


254,455

MAILBOX

Alexander M. Cornwell, Jr., St. Louis, and Joseph N. Miller, Overland, both of Mo., assignors to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Nov. 14, 1977, Ser. No. 851,540
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



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PATENTS WERE ISSUED ON THE 11TH DAY OF MARCH, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Bomball, William A.; and Swift, Thomas G., 4,192,783, Cl. 260-8.000.

A. H. Robins Company, Incorporated: *See*—
Cloyd, Grover D.; Miller, Robert L.; and Lucas, Donald M., 4,192,887, Cl. 424-283.000.
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A. L. Lee Corporation: *See*—
Lee, Arthur L.; and Coval, Arthur B., 4,192,405, Cl. 188-170.000.

A-T-O Inc.: *See*—
Latina, Roland N., 4,192,018, Cl. 2-19.000.

Ab Gothenburg Motor: *See*—
Barth, Aksel, 4,192,621, Cl. 403-15.000.

Abbott Laboratories: *See*—
Genese, Joseph N., 4,192,306, Cl. 128-214.400.
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Abe, Naoto: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.

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Hilzinger, Fritz; and Schwarz, Theodor, 4,192,315, Cl. 128-346.000.

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Derouette, Jean-Jacques; Dartoy, Jacques; Fournier, Jacques; and Vollerin, Bernard, 4,192,371, Cl. 165-1.000.

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Wagensonner, Eduard; Rieder, Alois; and von Fischern, Bernhard, 4,192,588, Cl. 354-43.000.

AGFA-Gevert, A.G.: *See*—
Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,192,605, Cl. 355-38.000.

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Khan, Mahboob; Godejahn, Jr. Gordan C.; Heimbigner, Gary L.; and Aghishian, Noubar A., 4,192,059, Cl. 29-571.000.

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Bellows, Kenneth O., 4,192,372, Cl. 165-5.000.

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Hida, Takashi; Mitsui, Tsutomu; Hashiride, Tadaaki; and Kuwana, Kazutaka, 4,192,157, Cl. 66-76.000.

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Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,192,345, Cl. 137-572.000.

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Mersek, Leo D., and Rettig, Peter P., 4,192,172, Cl. 72-420.000.

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Stamm, Kurt, 4,192,977, Cl. 179-111.00E.

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Junger, Rudolf; and Maulhardt, Hans-Joachim, 4,192,760, Cl. 252-79.000.

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Cornou, Jean, 4,192,430, Cl. 220-1.500.

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Cachia, Joseph M., 4,192,530, Cl. 280-802.000.
Marshall, Robert M.; and Dardoufas, Kimon C., 4,192,754, Cl. 252-8.800.
Sweeney, Richard F.; and Sukornick, Bernard F., 4,192,822, Cl. 260-653.000.
Tajkowski, Edward G., 4,192,923, Cl. 521-117.000.

Allis-Chalmers Corporation: *See*—
Goldman, Holliday L.; and Winther, Svend E., 4,192,482, Cl. 251-56.000.

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Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., 4,192,767, Cl. 252-312.000.

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Michaels, Alan S., 4,192,308, Cl. 128-260.000.

Alzhanov, Tleubai M.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

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Perun, William D.; and Amatangelo, Paul C., 4,192,497, Cl. 271-18.000.

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Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,192,773, Cl. 252-429.00R.

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Stanger, Robert J.; and Siebens, Larry N., 4,192,572, Cl. 339-111.000.

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Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,192,950, Cl. 562-500.000.
Heffernan, William R.; Vega, Mary-Louise; and Rockwell, Edward T., Sr., 4,193,109, Cl. 362-34.000.
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Wang, Samuel S.; and Smith, Eugene L., Jr., 4,192,739, Cl. 209-166.000.
Wright, William B., Jr.; and Hardy, Robert A., Jr., 4,192,803, Cl. 260-243.300.

American District Telegraph Company: *See*—
Cooper, Glenn F.; and Enemark, Robert B., 4,193,069, Cl. 340-630.000.
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Glamkowski, Edward J.; and Fortunato, James M., 4,192,874, Cl. 424-248.540.
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Knepper, William H., Jr., 4,192,034, Cl. 15-21.00A.
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Amick, James A.: *See*—
Bucker, Edward R.; and Amick, James A., 4,192,720, Cl. 204-14.00N.
AMP Incorporated: *See*—
Bickford, David E.; Southard, Robert K.; Sucheski, Matthew M.; and Wagner, Earl W., 4,192,207, Cl. 83-42.000.
Laudig, Ronald C.; and Morelli, John A., 4,192,566, Cl. 339-47.00R.
Marks, Richard L.; and Weidler, Charles H., 4,192,568, Cl. 339-91.00R.
AMSTED Industries Incorporated: *See*—
Korpics, Frank J., 4,192,240, Cl. 105-225.000.
Wykoff, Richard H., 4,192,747, Cl. 210-83.000.
Anamet Laboratories, Inc.: *See*—
Holt, Neil L., 4,192,194, Cl. 73-794.000.
Anchor Hocking Corporation: *See*—
Oglesbee, Richard K., 4,192,421, Cl. 206-426.000.
Anderson, Phillip R.: *See*—
Hodges, Frank P.; Fowler, Harold W.; and Anderson, Phillip R., 4,192,246, Cl. 114-23.000.
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Anderson, Robert L.: *See*—
Lobdell, Donn D.; Herman, Stephen J.; Anderson, Robert L.; and Goyne, Thomas E., 4,193,004, Cl. 250-577.000.
Anner, Georg; and Wehrli, Hansuli, to Ciba-Geigy Corporation. Process for the manufacture of steroid carboxylic acid lactones. 4,192,802, Cl. 260-239.570.
Anonima Castelli S.p.A.: *See*—
Hell, Hans, 4,192,106, Cl. 52-36.000.
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Anthony, Andrew J., to Combustion Engineering Inc. Peripheral pin alignment system for fuel assemblies. 4,192,716, Cl. 176-78.000.
Antoniuk, Andrew V.; Hankinson, Lawrence V.; Boulter, David M.; and McMillan, William R., to Celanese Canada Limited. Method to express liquid from wet fibrous material. 4,192,228, Cl. 100-37.000.
Aoki, Eiichiro: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,192,211, Cl. 84-1.010.
Yamaga, Eiichi; Aoki, Eiichiro; and Imamura, Akio, 4,192,212, Cl. 84-1.030.
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Vache, Marcel, 4,192,284, Cl. 126-38.000.
Applied Technologies Associates: *See*—
Van Steenwyk, Donald H.; Cash, John R.; and Ott, Paul W., 4,192,077, Cl. 33-313.000.
Araki, Yoshitaka: *See*—
Sato, Akihiko; and Araki, Yoshitaka, 4,192,598, Cl. 354-153.000.
Arase, Shingo; and Lahr, Roy J., to Xerox Corporation. Apparatus for assisting in the transposition of foreign language text. 4,193,119, Cl. 364-900.000.
Araya, Takeshi: *See*—
Udagawa, Tsugio; Araya, Takeshi; and Yoshida, Takashi, 4,192,986, Cl. 219-137.00R.
Arborg, Ole J. M. Propelling nozzle for means of transport in air or water. 4,192,461, Cl. 239-265.170.
Arcair Company: *See*—
Gale, Paul E.; and Toth, Endre L., 4,193,021, Cl. 318-568.000.
Archer, Henry W.: *See*—
Phillips, Clarence A. L.; and Archer, Henry W., 4,192,668, Cl. 71-70.000.
ARCO Medical Products Company: *See*—
Walters, Robert A.; Johnson, William L.; and Bivins, Gary W., 4,192,316, Cl. 128-419.0PG.
Arendt, Hans F. Device for sealing an aperture in a partition wall through which a rotating drum extends. 4,192,518, Cl. 277-27.000.
Arent, Asa S. Solar water heater. 4,192,291, Cl. 126-439.000.
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Armco Inc.: *See*—
Kirkland, Kerry G.; and Masciopinto, Anthony J., 4,192,383, Cl. 166-341.000.
Martin, Mulford, Jr., 4,192,113, Cl. 52-282.000.
Armstrong, Allen E.; and McCullough, John E., to Arthur D. Little, Inc. Scroll-type fluid displacement apparatus with peripheral drive. 4,192,152, Cl. 62-402.000.
Arnaud, Henry, to Regie Nationale des Usines Renault. Apparatus for the recirculation of the exhaust gases of internal combustion engines. 4,192,264, Cl. 123-119.00A.
Arriaza, Ramon E.: *See*—
Ay, Leo E.; and Arriaza, Ramon E., 4,192,173, Cl. 73-11.000.
Arthur D. Little, Inc.: *See*—
Armstrong, Allen E.; and McCullough, John E., 4,192,152, Cl. 62-402.000.
Arvanitakis, Kostas S. Liquid clarification system. 4,192,746, Cl. 210-73.00S.
Arvin Industries, Inc.: *See*—
Williams, Ronald S.; and Hill, Robert S., 4,192,531, Cl. 285-222.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Gensho, Takahashi; Masamitsu, Yanai; Masakazu, Kurihara; Yoneharu, Tanaka; and Kazuhiro, Suzuoki, 4,192,684, Cl. 430-284.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Karikawa, Tohru, 4,192,600, Cl. 354-212.000.
Tokutomi, Seijiro, 4,192,589, Cl. 354-53.000.
Asanuma, Katsumi: *See*—
Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, 4,192,594, Cl. 354-90.000.
Ashland Oil, Inc.: *See*—
Carlos, Donald D., 4,192,812, Cl. 260-406.000.
Aspro, Inc.: *See*—
Stoner, Larry L., 4,192,412, Cl. 192-105.0CD.
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Associated Engineering Limited: *See*—
Hunt, Norman, 4,192,398, Cl. 180-178.000.
Atari, Inc.: *See*—
Rains, Lyle V.; Bristow, Stephen D.; and Patak, Richard J., 4,192,507, Cl. 273-311.000.
Romano, John V., 4,193,108, Cl. 361-399.000.
Atlantic Richfield Company: *See*—
Smith, Robert H., 4,192,652, Cl. 44-10.00R.
Worrell, G. Richard; and McKay, Frank F., Jr., 4,192,656, Cl. 48-192.000.
Worrell, G. Richard, 4,192,657, Cl. 48-192.000.
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Atlas Products, Inc.: *See*—
Wyckoff, Frank K.; and Silver, Roger C., 4,192,626, Cl. 404-123.000.
Atomic Products Corporation: *See*—
Foster, Edward H.; and Reiss, James M., 4,192,438, Cl. 222-5.000.
Auerbach, Richard: *See*—
Greenberg, Harry; and Auerbach, Richard, 4,193,077, Cl. 343-747.000.
Austermann, John F., Jr.; and Pack, Jerome E., to Lear Siegler, Inc. Vehicle axle including endways opening axle end. 4,192,396, Cl. 180-252.000.
Automatic Tool Company, Inc.: *See*—
Hamilton, Jerry W., 4,192,171, Cl. 72-416.000.
Automatik Apparate-Maschinenbau H. Hench GmbH: *See*—
Hunke, Friedrich; and Philipp, Heinz, 4,192,635, Cl. 425-71.000.
Automation 2000 S.A.: *See*—
Lobermann, Claude; and Croitoriu, Jean-Claude, 4,192,174, Cl. 73-19.000.
Automobiles Peugeot: *See*—
Poirier, Daniel, 4,192,410, Cl. 192-4.00A.
Automotive Products Limited: *See*—
Rawlings, Dennis G., 4,192,413, Cl. 192-106.200.
Autovox, S.p.A.: *See*—
Cicatelli, Rodolfo, 4,192,197, Cl. 74-380.000.
Avellis, Cosmo L.; Pavone, Carlo; and Wolfkamp, Albertus, to Edcliff Instruments. Pressure ratio transducer system. 4,192,183, Cl. 73-182.000.
Avery International Corporation: *See*—
Brown, Frank E., 4,192,703, Cl. 156-443.000.
Avnet, Inc.: *See*—
Greenberg, Harry; and Auerbach, Richard, 4,193,077, Cl. 343-747.000.
Ay, Leo E.; and Arriaza, Ramon E., to Pacific Scientific Company. Eccentric pin mounting system. 4,192,173, Cl. 73-11.000.
Ayres, Barry E.: *See*—
Phillipps, Gordon H.; May, Peter J.; and Ayres, Barry E., 4,192,871, Cl. 424-241.000.
Azam, Guy, to C.G.R.MeV. Neutrontherapy apparatus using a linear accelerator of electrons. 4,192,998, Cl. 250-502.000.
B. F. Goodrich Company, The: *See*—
Fisher, John M., 4,192,339, Cl. 137-223.000.
Baba, Kohzo; and Nagatomo, Itsuyoshi, to Hyuga Smelting Co., Ltd. Method of manufacturing granulated ferronickel. 4,192,673, Cl. 75-0.50C.
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Paust, Joachim; and Schumacher, Horst, 4,192,806, Cl. 260-340.700.
Baehler, Bruno: *See*—
Tronchet, Jean M. J.; Baehler, Bruno; Rossi, Alberto; Baschang, Gerhard; and Sele, Alex, 4,192,868, Cl. 424-180.000.
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Bales-McCoin Research, Inc.: *See*—
McCoin, Dan K., 4,192,200, Cl. 74-690.000.
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Vydrin, Vladimir N.; Barkov, Leonid A.; Pastukhov, Valery V.; Dolgov, Sergei I.; and Sysoev, Vladimir S., 4,192,165, Cl. 72-238.000.
Barnes, David I.: *See*—
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McKinstry, Paul H.; and Barnhart, Robert R., 4,192,790, Cl. 260-31.2MR.
Barnum, Charly. Automatic sensitivity level adjustment. 4,193,055, Cl. 367-94.000.
Barradas, George; and Hetherington, Michael W. Clamping arm mechanism for curling iron. 4,192,328, Cl. 132-37.00R.
Barringer, Anthony R., to Barringer Research Limited. Detection of concealed metalliferous deposits, hydrocarbons and explosives. 4,192,176, Cl. 73-28.000.
Barringer Research Limited: *See*—
Barringer, Anthony R., 4,192,176, Cl. 73-28.000.
Barten, Piet G. J., to U.S. Philips Corporation. Color television display tube. 4,193,015, Cl. 313-408.000.
Barth, Aksel, to Ab Gothenburg Motor. Method for interconnecting two shaft-ends and a shaft coupling made in accordance with said method. 4,192,621, Cl. 403-15.000.
Bartl, Herbert: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Hardt, Dietrich, 4,192,940, Cl. 528-370.000.
Bartscher, Wolfgang; Sachtler, Jurgen; and Schultner, Roland, to Dragerwerk Aktiengesellschaft. Respiratory gas humidifier. 4,192,836, Cl. 261-142.000.
Baschang, Gerhard: *See*—
Tronchet, Jean M. J.; Baehler, Bruno; Rossi, Alberto; Baschang, Gerhard; and Sele, Alex, 4,192,868, Cl. 424-180.000.
Baselice, Louis R.; Freakes, Anthony; Miller, Joseph A.; and Ventz, George A., to General Corrugated Machinery Co., Inc. Apparatus for feeding case blank sheets. 4,192,496, Cl. 271-10.000.
BASF Aktiengesellschaft: *See*—
Broecker, Franz J.; Duembgen, Gerd; Glietenberg, Helmut; Miesen, Ernest; and Schwarzmann, Matthias, 4,192,807, Cl. 260-343.600.
Kiehs, Karl; and Theobald, Hans, 4,192,831, Cl. 260-987.000.
Meissner, Bernd; Fliege, Werner; Woerz, Otto; Dudeck, Christian; and Diehm, Hans, 4,192,820, Cl. 260-601.00R.
Merger, Franz; Towae, Friedrich; and Schroff, Ludwig, deceased, 4,192,949, Cl. 560-67.000.
Rapp, Guenther; Thomas, Erwin; Wolf, Dieter; Kuerten, Heribert; and Zehner, Peter, 4,192,856, Cl. 423-387.000.
Schott, Eberhard P., 4,192,671, Cl. 71-121.000.
Bass, Merlyn D.: *See*—
Lawrence, Allan K.; Bass, Merlyn D.; Black, Robert D.; and Krafka, Jerry L., 4,192,468, Cl. 241-101.700.
Bastgen, Wendel; Schreiber, Helmut; and Grumbel, Eugen, to Albert Klein KG. Process of dewatering sludge-type material and installation for carrying out the process. 4,192,743, Cl. 210-42.00R.
Bastian, Lehyman J.; and Kley, Richard D., to Scott Paper Company. Roll sheet dispenser. 4,192,442, Cl. 226-127.000.
Batelle-Institut e.V.: *See*—
Deibig, Heinrich; Heide, Helmut; Reiner, Roland; and Koster, Kari, 4,192,021, Cl. 3-1.900.
Batjukov, Vladimir I.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.
Battelle Memorial Institute: *See*—
Derouette, Jean-Jacques; Dartoy, Jacques; Fournier, Jacques; and Vollerin, Bernard, 4,192,371, Cl. 165-1.000.
Koehmstedt, Paul L., 4,192,963, Cl. 174-6.000.
Batts, John H., to John Thomas Batts, Inc. Clamp construction for article hangers. 4,192,441, Cl. 223-96.000.
Bauer, Frank I.: *See*—
Calhoun, Gregory L.; Kramer, Arthur W.; Bauer, Frank I.; and Bencloski, William A., 4,192,067, Cl. 30-379.000.
Bauer, Kurt; Krempel, Alfred; Molleken, Reiner; Wedemeyer, Karlfried; and Fiege, Helmut, to Haarmann & Reimer. Process for the preparation of pure 2-hydroxybenzyl alcohol, pure 4-hydroxybenzyl alcohol or a mixture of both hydroxy-benzyl alcohols. 4,192,959, Cl. 568-764.000.
Bauer, Wolfgang; and Ribka, Joachim, to Cassella Aktiengesellschaft. Process for the production of aminophenylaminobenzimidazoles. 4,192,947, Cl. 548-334.000.
Baum, Henry K., to GTE Automatic Electric Laboratories Incorporated. Flat ribbon cable retainer. 4,192,965, Cl. 174-135.000.
Baumann, Heinz, to Siemens Aktiengesellschaft. Tomograph for producing transverse layer images. 4,192,997, Cl. 250-445.00T.
Baxter Travenol Laboratories, Inc.: *See*—
Jones, Horace T., 4,192,611, Cl. 356-320.000.
Bayer Aktiengesellschaft: *See*—
Dieterich, Dieter, 4,192,938, Cl. 528-67.000.
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Hardt, Dietrich, 4,192,940, Cl. 528-370.000.
Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., 4,192,936, Cl. 528-59.000.
Noll, Klaus; Nachtkamp, Klaus; and Pedain, Josef, 4,192,937, Cl. 528-59.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,925, Cl. 521-163.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,926, Cl. 521-163.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,927, Cl. 521-165.000.
Baylis, Anthony B.: *See*—
Slinkard, William E.; and Baylis, Anthony B., 4,192,951, Cl. 562-549.000.
BBC Brown Boveri & Company Limited: *See*—
Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, 4,192,696, Cl. 148-101.000.
Bearden, Roby, Jr.: *See*—
Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,192,735, Cl. 208-112.000.
Beatrice Foods Co.: *See*—
Chow, Ho, 4,192,464, Cl. 239-373.000.
Kridler, Edward L.; Eisenhauer, Marvin W.; and Huson, Loyal A., 4,192,283, Cl. 126-25.0AA.
Beaudet, Didier M., to Societe Anonyme de Telecommunications. Magnetostrictive mechanical filter. 4,193,051, Cl. 333-201.000.
Bebin, Jean: *See*—
Bernard, Jacques; Bebin, Jean; and Hazard, Jean-Pierre, 4,192,742, Cl. 210-17.000.
Beck, Heinz; Frassek, Karl H.; Holtvoigt, Werner; and Mukerjee, Ambar, to Akzona Incorporated. Esterified olefin-maleic anhydride copolymers. 4,192,930, Cl. 525-227.000.
Beckman, Christopher P. Fuel system. 4,192,270, Cl. 123-122.00A.
Beckman, Klaus; and Redemann, Richard, to Gewerkschaft Eisenhutte Westfalia. Crushing apparatus. 4,192,471, Cl. 241-185.00R.
Becton, Dickinson and Company: *See*—
Megahed, Shenoda S., 4,192,320, Cl. 128-764.000.
Reese, Max G.; and Hales, Richard H., 4,192,858, Cl. 424-1.000.
Yerman, Arthur J., 4,192,429, Cl. 215-307.000.
Bekbulatov, Ildgam A.: *See*—
Varlamov, Gennady D.; Mamatov, Juldash; Bekbulatov, Ildgam A.; and Madaliev, Shavkat, 4,192,931, Cl. 525-489.000.
Bel Air Aluminum Manufacturing, Inc.: *See*—
Laureano, Angel F., 4,192,536, Cl. 292-228.000.
Belcastro, Harry, Sr.: *See*—
Hawkins, Gary, 4,193,067, Cl. 340-546.000.
Bell, Dennis M.: *See*—
Fesler, John C.; and Bell, Dennis M., 4,193,103, Cl. 360-122.000.
Bell Telephone Laboratories, Incorporated: *See*—
Balde, John W.; Spencer, Robert A.; and Thompson, Richard K., Jr., 4,192,062, Cl. 29-857.000.
Meinke, James M., 4,193,123, Cl. 364-900.000.
Strautz, Michael G., 4,192,571, Cl. 339-103.00M.
Van Horn, Robert H., 4,192,570, Cl. 339-98.000.
Bellows, Kenneth O., to Air Preheater Company, Inc., The. Adjustable lever for fire detection system. 4,192,372, Cl. 165-5.000.
Beloit Corporation: *See*—
Dreher, George L., 4,192,712, Cl. 162-265.000.
Beltrani, Gianni: *See*—
Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, 4,192,298, Cl. 128-205.240.

Bencloski, William A.: *See*—
Calhoun, Gregory L.; Kramer, Arthur W.; Bauer, Frank I.; and Bencloski, William A., 4,192,067, Cl. 30-379.000.

Bendix Corporation, The: *See*—
Presley, Rex W., 4,192,189, Cl. 73-505.000.

Benini, Fernando, to CIR- S.p.A.-Divisione Sasib. Ticket-issuing system. 4,193,114, Cl. 364-200.000.

Benkoe, Elisabeth, Executrix: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, Executrix; and Dantzer, Elonne, 4,192,092, Cl. 46-123.000.

Benkoe, Elisabeth, Executrix for Estate of Erwin Benkoe: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, Executrix; and Dantzer, Elonne, 4,192,092, Cl. 46-123.000.

Benkoe, Erwin, deceased: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, Executrix; and Dantzer, Elonne, 4,192,092, Cl. 46-123.000.

Bennett, Derek J.; and Hogan, Daniel J., to Bunker Ramo Corporation. Automatic deployment of horizontal linear sensor array. 4,193,057, Cl. 367-153.000.

Bentz, Gerard: *See*—
Gilbert, Ghislain; Bentz, Gerard; and Galey, Jean, 4,192,147, Cl. 62-49.000.

Beresniewicz, Aleksander; and Gallagher, John P., to Du Pont de Nemours, E. I., and Company. Thermosetting, electrostatically sprayable compositions containing blocked acid catalyst. 4,192,826, Cl. 525-425.000.

Berg, Charles A., to Pyreflex Corporation. Heat conservation in workpieces. 4,192,646, Cl. 432-239.000.

Berg, Josef, to Klockner-Humboldt-Deutz Aktiengesellschaft. Multicylinder reciprocating piston internal combustion engine. 4,192,261, Cl. 123-58.00B.

Berger, Eugene; and Bienfait, Charles, to Solvay & Cie. Solid catalyst and process for the preparation thereof. 4,192,772, Cl. 252-429.00C.

Berger, Hermann, to U.S. Philips Corporation. Circuit arrangement for receiving one of the sidebands from a double sideband signal. 4,193,035, Cl. 455-203.000.

Berger, Leo; and Schmidt, Robert A., to Hoffmann-La Roche Inc. Certain 8-halodibenzofuran-3-alkanols. 4,192,809, Cl. 260-346.710.

Bergeron, Alfred. Method for manufacturing fully sealed piston ring. 4,192,051, Cl. 29-156.600.

Berghof, Winfried; and Pichler, Alfred, to Siemens Aktiengesellschaft. Method for the production of integrated magnetic head structures. 4,192,985, Cl. 219-121.0EM.

Bergman, William D. Tow truck light support. 4,192,427, Cl. 212-8.00R.

Bergquist, Lennart, to Volvo BM AB. Spring-suspended bogie with two or more wheel axles. 4,192,528, Cl. 280-677.000.

Bergstrom, John R.; Hultman, Bengt G.; and Dalborg, Astrid T. P., to Mo och Domsjo Aktiebolag. Method for controlling the addition of active chemical for delignifying and/or bleaching cellulose pulp suspended in a liquor containing chemicals reactive with the delignifying and/or bleaching chemical. 4,192,708, Cl. 162-49.000.

Berkbigler, Kenneth A., to ACF Industries, Incorporated. Carburetor. 4,192,834, Cl. 261-52.000.

Bernard, Jacques; Bebin, Jean; and Hazard, Jean-Pierre, to Degremont S.A. Process and apparatus for the biological treatment of waste water. 4,192,742, Cl. 210-17.000.

Bernatt, Joseph; and Steegmueller, Alfred, to S & C Electric Company. High voltage fuse having attached tubular members. 4,192,534, Cl. 285-382.200.

Berry, Thomas: *See*—
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, 4,192,047, Cl. 28-220.000.

Bertoglio, Ottavio; Caccia, Aurelio; Fidanza, Riccardo; and VanVeen, Wouter M. D., to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A. Pay-telephone station with deferred collection. 4,192,972, Cl. 179-6.30R.

Bertolasi, Robert B., to Kelsey-Hayes Company. Analog/digital numerical control system. 4,193,022, Cl. 318-592.000.

Bertozzi, Eugene R., to Thiokol Corporation. Cured polysulfide polymers suitable for hot melt applications. 4,192,941, Cl. 528-374.000.

Bess, Jack: *See*—
Wiggins, Robert W.; Ettenhofer, Kurt L.; and Bess, Jack, 4,193,129, Cl. 367-106.000.

Bethlehem Steel Corporation: *See*—
Weimer, James C.; Locks, William S.; Wilson, Edwin B.; and Miller, Francis G., 4,192,551, Cl. 299-1.000.

Beuch, Wallace E.; O'Konski, George J.; Rusch, Kenneth D.; and Wytaski, Thomas A., to International Business Machines Corporation. Disk file machine with cable connection to transducers. 4,193,102, Cl. 360-105.000.

Bevins, John R.: *See*—
Bogema, Edward J.; Vandervoort, John R.; and Bevins, John R., 4,192,196, Cl. 74-339.000.

Bickford, David E.; Southard, Robert K.; Sucheski, Matthew M.; and Wagner, Earl W., to AMP Incorporated. Method for feeding a plurality of wires. 4,192,207, Cl. 83-42.000.

Bienfait, Charles: *See*—
Berger, Eugene; and Bienfait, Charles, 4,192,772, Cl. 252-429.00C.

Bierhoff, Martinus P. M.: *See*—
Kleuters, Wilhelm J.; Van Rosmalen, Gerard E.; Bierhoff, Martinus P. M.; and Immink, Kornelis A., 4,193,091, Cl. 358-128.500.

Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., to S & C Electric Company. Circuit interrupting device with arcing rod speed modifying means. 4,193,053, Cl. 337-275.000.

BioResearch, Inc.: *See*—
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,192,798, Cl. 260-112.50R.

Bios Inc.: *See*—
Dam, Naim G.; and Landau, Monroe A., 4,192,318, Cl. 128-708.000.

Bird, John M.; and Ringwood, Alfred E., to Bird, John N. Container for radioactive nuclear waste materials. 4,192,765, Cl. 252-301.10W.

Bird, John N.: *See*—
Bird, John M.; and Ringwood, Alfred E., 4,192,765, Cl. 252-301.10W.

Bishoff, Mark L.; and Bishoff, Theodore. Interfitting and removable modular, frame, storage units. 4,192,562, Cl. 312-108.000.

Bishoff, Theodore: *See*—
Bishoff, Mark L.; and Bishoff, Theodore, 4,192,562, Cl. 312-108.000.

Bison-Werke Bahre and Greten GmbH and Co. KG: *See*—
Greten, Berndt, 4,192,417, Cl. 198-601.000.

Bittner, Louis M. Golf swing control alarm. 4,193,065, Cl. 340-323.00R.

Bivins, Gary W.: *See*—
Walters, Robert A.; Johnson, William L.; and Bivins, Gary W., 4,192,316, Cl. 128-419.0PG.

Bixby, James A.; Lemke, James U.; and Lentz, Robert A., to Spin Physics, Inc. Segmented video playback apparatus with ancillary recording medium. 4,193,098, Cl. 360-10.000.

Black, Robert D.: *See*—
Lawrence, Allan K.; Bass, Merlyn D.; Black, Robert D.; and Krafka, Jerry L., 4,192,468, Cl. 241-101.700.

Blanchard, Bruno; Legressus, Claude; Massignon, Daniel; Sopizet, Rene; and Stefani, Rene, to Commissariat a l'Energie Atomique. Method for controlling the migration of a chemical species within a solid substrate. 4,193,003, Cl. 250-492.00A.

Blanco, Rodney A.; and Massaro, Anthony A., Jr., to Westinghouse Electric Corp. Method for retubing a steam generator. 4,192,053, Cl. 29-157.400.

Blazek, Gustav; and Charych, Arthur, to Eaton Corporation. Low angle elevation guidance system. 4,193,075, Cl. 343-108.00M.

Blessing, Hubert; and Allison, Gaylord D., to Levi Strauss & Co. Sewing machine thread monitor. 4,192,243, Cl. 112-273.000.

Blom, Nico; and Wor, Jan T., to U.S. Philips Corporation. Printer, provided with an impact device comprising a transducer. 4,192,230, Cl. 101-93.030.

Blomquist, James E.: *See*—
Kondur, Nicholas, Jr.; Blomquist, James E.; and Rucinski, Roland R., 4,192,618, Cl. 400-124.000.

Blose, Thomas L., to Hydril Company. Dovetail connection for pin and box joints. 4,192,533, Cl. 285-334.000.

Boddie, Arthur W. Hepatic isolation and perfusion circuit assembly. 4,192,302, Cl. 128-214.00R.

Bodlaj, Viktor, to Siemens Aktiengesellschaft. Device for contact-free thickness measurement. 4,192,612, Cl. 356-381.000.

Boeing Commercial Airplane Company: *See*—
Raman, Rune E. B., 4,192,389, Cl. 173-15.000.

Boeing Company, The: *See*—
Falcioni, Joseph G., 4,192,058, Cl. 29-526.00A.
Farquhar, Bannister W.; and Sloan, Denis, 4,192,336, Cl. 137-15.100.

Bogema, Edward J.; Vandervoort, John R.; and Bevins, John R., to Eaton Corporation. Blocked change gear transmission and improved blocker and jaw clutch assembly therefor. 4,192,196, Cl. 74-339.000.

Bolasco, Franco: *See*—
Botre, Claudio; Bolasco, Franco; Memoli, Adriana; and Molteni, Luigi, 4,192,894, Cl. 424-329.000.

Bomball, William A.; and Swift, Thomas G., to A. E. Staley Manufacturing Company. Vegetable based, remoistenable adhesive for pregummed tape. 4,192,783. Cl. 260-8.000.

Bond, Helen I. Head and neck supportive device for hemiside reclining persons. 4,192,029, Cl. 5-441.000.

Bondinell, William E.; and Pendleton, Robert G., to SmithKline Corporation. Pharmaceutical compositions and method of inhibiting phenylethanolamine N-methyltransferase. 4,192,888, Cl. 424-321.000.

Bone, Arnold R., to Dennison Manufacturing Company. Air powered installation of fasteners. 4,192,358, Cl. 140-123.600.

Bonnaud, Bernard: *See*—
Cousse, Henri; Bonnaud, Bernard; Tarayre, Jean-Pierre; and Casadio, Silvano, 4,192,883, Cl. 424-274.000.

Bonorand, Simon, to Caviezel, Guido. Teaching aid device for teaching the basic principles of arithmetic. 4,192,085, Cl. 35-31.00E.

Borelly, Wolfgang. Process and apparatus for the production of corrosion protection for cables made of parallel wire strands. 4,192,057, Cl. 29-458.000.

Borg, Carl W. Adjustable joist hanger. 4,192,623, Cl. 403-232.100.

Borg-Warner Corporation: *See*—
Fogelberg, Mark J., 4,192,411, Cl. 192-36.000.

Borlinghaus, Hans J., to General Motors Corporation. Escutcheon and cover assembly for a lock cylinder. 4,192,161, Cl. 70-455.000.

Borodin, Ivan V.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.

Boschetti, Egisto: *See*—
Brown, Eric; Boschetti, Egisto; Corgier, Monique M.; and Touet, Joel, 4,192,784, Cl. 260-8.000.

Botre, Claudio; Bolasco, Franco; Memoli, Adriana; and Molteni, Luigi, to Dr. L. ° Zambeletti S.p.A. Compound with disinfectant activity

and pharmaceutical compositions containing the same. 4,192,894, Cl. 424-329.000.
Boulter, David M.: *See*—
Antoniuk, Andrew V.; Hankinson, Lawrence V.; Boulter, David M.; and McMillan, William R., 4,192,228, Cl. 100-37.000.
Bouman, Antonius J. M.: *See*—
Lederer, Michael; and Bouman, Antonius J. M., 4,192,797, Cl. 525-243.000.
Bouvet, Jean-Victor: *See*—
Henry, Raymond; Resneau, Jean-Claude; and Bouvet, Jean-Victor, 4,192,574, Cl. 350-96.170.
Bowers, John J., to Gould Inc. Connecting line generator. 4,193,122, Cl. 364-900.000.
Braden, William B., Jr.: *See*—
Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., 4,192,755, Cl. 252-8.55D.
Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., 4,192,767, Cl. 252-312.000.
Bradley Corporation: *See*—
Williams, Frank N., 4,192,026, Cl. 4-203.000.
Bralorne Resources Limited: *See*—
Gray, Gary D., 4,192,155, Cl. 64-23.000.
Brass & Bronze Mfg. Co. Ltd.: *See*—
Simko, Paul; and Strasser, Albert, 4,192,099, Cl. 49-366.000.
Bratton, Jerry L.: *See*—
Pollehn, Herbert K.; and Bratton, Jerry L., 4,193,011, Cl. 313-94.000.
Brau, Charles A.; Stein, William E.; and Rockwood, Stephen D., to United States of America, Energy. Microwave accelerator E-beam pumped laser. 4,193,043, Cl. 331-94.5PE.
Brauer, Hans, to Friedrich Kocks GmbH & Company. Rolling mills. 4,192,164, Cl. 72-234.000.
Braun AG: *See*—
Wich, Robert, 4,192,719, Cl. 204-11.000.
Bray Oil Company, Inc.: *See*—
Dickey, Charles R.; and Williamson, Paul M., 4,192,758, Cl. 252-33.000.
Breslow, Jeffrey D.: *See*—
Erickson, Erick E.; and Breslow, Jeffrey D., 4,192,512, Cl. 273-243.000.
Brewer, Joe E., to Westinghouse Electric Corp. High-density memory with non-volatile storage array. 4,193,128, Cl. 365-228.000.
Brewster, Philip W. Alkyl phenol solutions of organo molybdenum complexes as friction reducing antiwear additives. 4,192,757, Cl. 252-32.70E.
Bridgham, John A.: *See*—
Kronick, Melvyn N.; Bryson, Charles E., III; Bridgham, John A.; and Eletr, Sam H., 4,192,996, Cl. 250-373.000.
Bristol-Myers Company: *See*—
Juby, Peter F., 4,192,944, Cl. 544-282.000.
Ueda, Yasutsugu, 4,192,801, Cl. 260-239.00A.
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.
Bristow, Stephen D.: *See*—
Rains, Lyle V.; Bristow, Stephen D.; and Patak, Richard J., 4,192,507, Cl. 273-311.000.
British Gas Corporation: *See*—
Brooks, Charles T., 4,192,654, Cl. 48-62.00R.
British Petroleum Company Limited, The: *See*—
Burbidge, Bernard W.; and Rees, David M., 4,192,771, Cl. 252-415.000.
Brockmann, Klaus-Dieter K., to U.S. Philips Corporation. Supply-arrangement for a line circuit. 4,192,975, Cl. 179-77.000.
Brodin, Eric, to Etablissements Unicor. Device in flue gas dampers. 4,192,310, Cl. 126-286.000.
Brodin, Henning: *See*—
Brodin, Nils H., 4,192,419, Cl. 198-750.000.
Brodin, Nils H., to Brodin, Henning. Conveyor. 4,192,419, Cl. 198-750.000.
Broecker, Franz J.; Duembgen, Gerd; Glietenberg, Helmut; Miesen, Ernest; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Manufacture of γ-butyrolactone from maleic anhydride. 4,192,807, Cl. 260-343.600.
Brookhyser, Byron B.; and Pierson, Darrell E., to Weyerhaeuser Company. Veneer drying and handling. 4,192,079, Cl. 34-13.800.
Brooks, Charles T., to British Gas Corporation. Coal gasification plant. 4,192,654, Cl. 48-62.00R.
Brougham, Robert W.; and Mitchell, Paul, to Picker Corporation. Television radiation imaging system and method. 4,193,089, Cl. 358-111.000.
Browall, Warella R.: *See*—
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., 4,192,842, Cl. 264-298.000.
Brown, Eric; Boschetti, Egisto; Corgier, Monique M.; and Touet, Joel, to Mar-Pha Societe d'Etudes et d'Exploitation de Marques. Hydrophilic copolymers, their preparation and their use in separation techniques. 4,192,784, Cl. 260-8.000.
Brown, Frank E., to Avery International Corporation. Universal labeling apparatus. 4,192,703, Cl. 156-443.000.
Brown, Ray B., Jr., to United States of America, Navy. Variable power attenuator for light beams. 4,192,573, Cl. 350-55.000.
Brown, Richard C., to General Motors Corporation. Microwave oven single wall construction. 4,192,431, Cl. 220-62.000.
Broyles, Marshall W.; and Schrader, Charles D. Stand-up trash retrieving and dumping device. 4,192,539, Cl. 294-19.00R.
Bruckner, Dietrich: *See*—
Henkelmann, Kurt; and Bruckner, Dietrich, 4,192,585, Cl. 353-101.000.
Brushaber, Larry R.: *See*—
Martin, Raymond H.; and Brushaber, Larry R., 4,192,701, Cl. 156-285.000.
Bruzzese, Tiberio; and Ferrari, Lorenzo, to Prospa N.V. Method for the treatment of dyslipidaemia and arteriosclerosis. 4,192,864, Cl. 424-122.000.
Bryson, Charles E., III: *See*—
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Buchheim, Rolf, to Volkswagenwerk Aktiengesellschaft. Combustion chamber for gas turbines. 4,192,139, Cl. 60-739.000.
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Buck, Robert; and Marhofer, Gerd. Electronic monitoring system with low energy consumption in quiescent state. 4,193,023, Cl. 323-19.000.
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Budd Company, The: *See*—
Herring, James M., Jr.; and Russell-French, Harry M., 4,192,238, Cl. 105-133.000.
Paul, John M., 4,192,239, Cl. 105-199.00R.
Budnick, Stanley F. Electrical terminal corrosion preventative and method for using same. 4,192,768, Cl. 252-389.00R.
Buggele, Alvin E. High pressure multi-purpose seal. 4,192,519, Cl. 277-115.000.
Bullock, David C., to Texas Instruments Incorporated. Swap and replicate gates for magnetic bubble memory. 4,193,124, Cl. 365-12.000.
Bundy, Gordon L., to Upjohn Company, The. Trans-2,3-didehydro-9-deoxy-9-methylene-ω-aryl-PGF compounds. 4,192,948, Cl. 560-55.000.
Bunker Ramo Corporation: *See*—
Bennett, Derek J.; and Hogan, Daniel J., 4,193,057, Cl. 367-153.000.
Burbidge, Bernard W.; and Rees, David M., to British Petroleum Company Limited, The. Process for dispersal and redispersal of platinum group metals comprising sulphiding in a stream of inert gas. 4,192,771, Cl. 252-415.000.
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Maisch, Wolfgang; and Burkel, Rainer, 4,192,279, Cl. 123-198.00F.
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Sacks, Norman M., 4,192,964, Cl. 174-73.00R.
Burroughs Corporation: *See*—
Cancelleri, Dan; and Thompson, Charles E., 4,192,729, Cl. 204-272.000.
Cykowski, Mark F., 4,193,113, Cl. 364-200.000.
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Babcock, Clarence L.; Busdiecker, Robert A.; and Hagedorn, Erwin C., 4,192,688, Cl. 106-39.700.
Butler, Frederick A.: *See*—
Sargent, Frank T.; and Butler, Frederick A., 4,192,027, Cl. 4-441.000.
Byers, Leroy R., to Northrop Corporation. Rudder pedal adjustment system. 4,192,476, Cl. 244-83.00K.
Bykov, Vladimir I.: *See*—
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Azam, Guy, 4,192,998, Cl. 250-502.000.
Cabot Corporation: *See*—
Paoletti, Alfred J., 4,192,983, Cl. 219-76.100.
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Bertoglio, Ottavio; Caccia, Aurelio; Fidanza, Riccardo; and Van-Veen, Wouter M. D., 4,192,972, Cl. 179-6.30R.
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Calgon Corporation: *See—*
Trace, William L.; and Walker, Jerry L., 4,192,844, Cl. 422-11.000.

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Wester, Gene W., 4,193,111, Cl. 363-84.000.

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von Linde, Robert, 4,192,655, Cl. 48-191.000.

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Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, 4,192,901, Cl. 426-580.000.

Calspan Corporation: *See—*
Schwartz, Edward C.; and Leney, Thomas F., 4,193,074, Cl. 343-16.00M.

Camera Plus, Inc.: *See—*
Penick, Ib, 4,192,596, Cl. 354-142.000.

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Croy, David G., 4,192,384, Cl. 166-356.000.

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Campos, Adolph A.; and Michele, Joseph V., 4,192,634, Cl. 418-61.00A.

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Daws, Lee F., 4,192,334, Cl. 135-4.00R.

Canadian Liquid Air Ltd., Air Liquide Canada Ltee: *See—*
Savard, Guy; Lee, Robert G. H.; and Hornsey, Derek, 4,192,740, Cl. 210-3.000.

Canadian Patents and Development Limited: *See—*
Chappell, Marcus S.; and Millar, Douglas A. J., 4,192,137, Cl. 60-39.16R.
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Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 4,192,608, Cl. 355-51.000.
Kurahayashi, Sadasuke; Kato, Yuzo; Tsuda, Shin; Muto, Hakaru; and Watanabe, Asao, 4,193,097, Cl. 358-261.000.
Tsunoi, Haruo; Morikawa, Teruo; Yamada, Katsuhiko; Ohkawara, Kenji; and Kubota, Atsushi, 4,192,229, Cl. 100-158.00R.

Capra, Uberto. Wheel-scrubbing mechanism for vehicle-washing apparatus. 4,192,037, Cl. 15-53.00B.

Card, David R., to Champion International Corporation. Packaging container including integral corner locks. 4,192,445, Cl. 229-35.000.

Carlos, Donald D., to Ashland Oil, Inc. Oxidation of waxes in the presence of long chain quaternary ammonium and phosphonium compounds. 4,192,812, Cl. 260-406.000.

Carlson, John A.; Rusch, Kenneth D.; and Sippel, David L., to International Business Machines Corporation. Collet loading apparatus. 4,193,101, Cl. 360-97.000.

Carpenter, C. Donald, to Vivian Manufacturing Company. Ice making apparatus. 4,192,151, Cl. 62-320.000.

Carros Industries (T Alpes Maritimes): *See—*
Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, 4,192,298, Cl. 128-205.240.

Carter, Ernest E., Jr.: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,192,378, Cl. 166-186.000.

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Casadei, Gianfranco. Automatic profile-copying device. 4,192,363, Cl. 144-145.00A.

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Cousse, Henri; Bonnaud, Bernard; Tarayre, Jean-Pierre; and Casadio, Silvano, 4,192,883, Cl. 424-274.000.

Casebow, Wilfred J. Apparatus for generating electrical power. 4,192,627, Cl. 405-76.000.

Cash, John R.: *See—*
Van Steenwyk, Donald H.; Cash, John R.; and Ott, Paul W., 4,192,077, Cl. 33-313.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,193,038, Cl. 328-104.000.
Takeuchi, Eiichi, 4,192,130, Cl. 368-155.000.

Cassella Aktiengesellschaft: *See—*
Bauer, Wolfgang; and Ribka, Joachim, 4,192,947, Cl. 548-334.000.

Casson, Alwin E. Camping accessory. 4,192,030, Cl. 5-420.000.

Caudle, Otis M., to Eggineers, Inc. Case packing apparatus. 4,192,121, Cl. 53-248.000.

Caviezel, Guido: *See—*
Bonorand, Simon, 4,192,085, Cl. 35-31.00E.

Celanese Canada Limited: *See—*
Antoniuk, Andrew V.; Hankinson, Lawrence V.; Boulter, David M.; and McMillan, William R., 4,192,228, Cl. 100-37.000.

Celanese Corporation: *See—*
Keith, Charles H.; and Tucker, Richard O., 4,192,838, Cl. 264-10.000.
Slinkard, William E.; and Baylis, Anthony B., 4,192,951, Cl. 562-549.000.

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Rassieur, Charles L.; and Hesskamp, Richard R., 4,192,485, Cl. 254-187.500.

Centre Technique des Industries Mecaniques: *See—*
Paraskevas, Dimitri, 4,192,610, Cl. 356-33.000.

Cerny, Frank J., Jr.; Helm, George D.; and Wesoloski, Ronald G., to Motorola, Inc. Balanced active mixer circuit. 4,193,036, Cl. 455-327.000.

Cessna Aircraft Company, The: *See—*
Alderson, Loren L.; and Truesdell, Delbert E., 4,192,337, Cl. 137-101.000.
Moyer, Laurence, 4,192,225, Cl. 92-169.000.

Cha, Chang Y., to Occidental Oil Shale, Inc. In situ retorting with high temperature oxygen supplying gas. 4,192,381, Cl. 166-261.000.

Cha, Chang Y. Method for establishing a combustion zone in an in situ oil shale retort having a pocket at the top. 4,192,552, Cl. 299-2.000.

Chabot, Ovila. Anti-skid wheel attachment device. 4,192,367, Cl. 152-225.00C.

Champion International Corporation: *See—*
Card, David R., 4,192,445, Cl. 229-35.000.
Garmon, Ivan E., 4,192,444, Cl. 229-28.00R.
McLaren, Edwin C., 4,192,443, Cl. 229-28.00R.
Rekow, Vernon C., 4,192,423, Cl. 206-586.000.

Champion Spark Plug Company: *See—*
Podiak, Richard S.; Houghton, LeRoy H.; and Rempes, Paul E., Jr., 4,193,012, Cl. 313-137.000.

Chang, Andrew K., to FMC Corporation. On the fly run-out correction for vehicle alignment. 4,192,074, Cl. 33-228.000.

Chapman, Charles C., to Phillips Petroleum Company. Energy efficient alkylation process. 4,192,825, Cl. 585-719.000.

Chappelear, Robert N.: *See—*
Schmandt, Gary M.; Chappelear, Robert N.; and Hand, Ronnie D., 4,192,663, Cl. 65-11.00R.

Chappell, Marcus S.; and Millar, Douglas A. J., to Canadian Patents and Development Limited. Turboshaft engine. 4,192,137, Cl. 60-39.16R.

Charych, Arthur: *See—*
Blazek, Gustav; and Charych, Arthur, 4,193,075, Cl. 343-108.00M.

Chasman, Richard A.; and Erickson, Wayne F., to Eastman Kodak Company. N-alkyl- or N-aryl-benzisoxazolone scavenger compounds. 4,192,678, Cl. 430-214.000.

Chattha, Mohinder S.: *See—*
Dickie, Ray A.; Holubka, Joseph W.; and Chattha, Mohinder S., 4,192,932, Cl. 525-511.000.

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Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,192,370, Cl. 164-252.000.

Chen, James L.; Cilento, Rudolfo D.; Hill, John A.; and La Via, Anthony L., to E. R. Squibb & Sons, Inc. Ostomy adhesive. 4,192,785, Cl. 260-17.4GC.

Chen, Sow-Mei L.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,192,950, Cl. 562-500.000.

Cheng, Hsiung, to Merck & Co., Inc. Texturized starch products. 4,192,900, Cl. 426-579.000.

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Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.

Chevron Research Company: *See—*
Bacskai, Robert, 4,192,939, Cl. 528-313.000.
Kluksdahl, Harris E., 4,192,736, Cl. 208-251.00H.

Chia, E. Henry; and Schoerner, Roger J., to Southwire Company. Aluminum copper alloy electrical conductor and method. 4,192,693, Cl. 148-2.000.

Chiba, Tadataka, to Kinsekisha Laboratory, Ltd. Piezo-electric oscillators with automatic gain control. 4,193,046, Cl. 331-109.000.

Chlorine Engineers Corporation, Ltd.: *See—*
Minami, Takeshi; and Toda, Shinichi, 4,192,724, Cl. 204-67.000.

Chong, Antonio T., to USI Far East Corporation. Integrated system for forming sheets and films of synthetic resins. 4,192,637, Cl. 425-140.000.

Chong, Ian M.: *See—*
Lemchen, Marc S.; Chong, Ian M.; and Klein, Carlton, 4,192,070, Cl. 433-11.000.

Chow, Ho, to Beatrice Foods Co. Compressed air sprayer. 4,192,464, Cl. 239-373.000.

Chrisman, Max G., to Owens-Corning Fiberglas Corporation. Platinum group metal layer on a refractory. 4,192,667, Cl. 65-374.0RM.

Chyung, Kenneth; and Megles, John E., Jr., to Corning Glass Works. Rapidly crystallized beta-spodumene glass-ceramic materials. 4,192,665, Cl. 65-33.000.

CH_2O, Inc.: *See—*
Courtright, Burr, 4,192,340, Cl. 137-344.000.

Ciba-Geigy Corporation: *See—*
Anner, Georg; and Wehrli, Hansuli, 4,192,802, Cl. 260-239.570.
Clark, David R.; Marshall, Alan; and Finan, Michael A., 4,192,744, Cl. 210-54.000.
Clauson-Kaas, Niels; Mattern, Gunter; and Traber, Walter, 4,192,946, Cl. 546-249.000.

Ferrini, Pier G.; Goschke, Richard; Sallmann, Alfred; and Rossi, Alberto, 4,192,873, Cl. 424-246.000.
Mueller, Karl F.; and Good, William R., 4,192,827, Cl. 525-123.000
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., 4,192,841, Cl. 264-117.000.
Tronchet, Jean M. J.; Baehler, Bruno; Rossi, Alberto; Baschang, Gerhard; and Sele, Alex, 4,192,868, Cl. 424-180.000.
Cicatelli, Rodolfo, to Autovox, S.p.A. Disengageable transmission device. 4,192,197, Cl. 74-380.000.
Cilento, Rudolfo D.: *See*—
Chen, James L.; Cilento, Rudolfo D.; Hill, John A.; and La Via, Anthony L., 4,192,785, Cl. 260-17.4GC.
Cincinnati Milacron Inc.: *See*—
Jessup, Wilbur F., 4,192,102, Cl. 51-103.00R.
Cioccio, Armand; and Folz, Walter C., to United States of America, Navy. Pulsed helium magnetometer. 4,193,029, Cl. 324-301.000.
CIR- S.p.A.-Divisione Sasib: *See*—
Benini, Fernando, 4,193,114, Cl. 364-200.000.
Citizen Watch Company Limited: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,192,135, Cl. 368-62.000.
Yoshida, Makoto, 4,192,134, Cl. 368-80.000.
Claassen, Volkert: *See*—
Welle, Hendricus B. A.; and Claassen, Volkert, 4,192,893, Cl. 424-327.000.
Clapham, Terrance N.: *See*—
Munnerlyn, Charles R.; and Clapham, Terrance N., 4,192,317, Cl. 128-646.000.
Clark, David J. Solar heat collection system. 4,192,289, Cl. 126-425.000.
Clark, David R.; Marshall, Alan; and Finan, Michael A., to Ciba-Geigy Corporation. Treatment of aqueous systems. 4,192,744, Cl. 210-54.000.
Clark, John D., to Clarke-Gravely Corporation. Steering sulky for two-wheel tractors. 4,192,525, Cl. 280-443.000.
Clark, Richard E.: *See*—
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,192,020, Cl. 3-1.500.
Clarke-Gravely Corporation: *See*—
Clark, John D., 4,192,525, Cl. 280-443.000.
Classic Corporation: *See*—
Fogel, Isaac, 4,192,031, Cl. 5-451.000.
Clauson-Kaas, Niels; Mattern, Gunter; and Traber, Walter, to Ciba-Geigy Corporation. Process for producing 3-hydroxy-5-halopyridines. 4,192,946, Cl. 546-249.000.
Cloyd, Grover D.; Miller, Robert L.; and Lucas, Donald M., to A. H. Robins Company, Incorporated. Ruminant coccidiostats. 4,192,887, Cl. 424-283.000.
Clugage, Robert G. Method and apparatus for supporting a golf ball. 4,192,504, Cl. 273-33.000.
Clugston, George D. Combined feeding and watering device for pets, having integral means for carrying water. 4,192,256, Cl. 119-51.500.
Coal Industry (Patents) Limited: *See*—
Robinson, Joseph G.; and Barnes, David I., 4,192,824, Cl. 5855-409.000.
Coaltex, Inc.: *See*—
Heimaster, John W., 4,192,550, Cl. 299-1.000.
Cobb, John M., to Texaco Inc. Exhaust gas recycling in an internal combustion engine. 4,192,267, Cl. 123-119.00A.
Cobe Laboratories, Inc.: *See*—
Lobdell, Donn D.; Herman, Stephen J.; Anderson, Robert L.; and Goyne, Thomas E., 4,193,004, Cl. 250-577.000.
Cohen, Noal, to Hoffmann-La Roche Inc. Mixtures of 3-pentenenitriles and 3-methylene-pentanenitriles. 4,192,816, Cl. 260-465.00D.
Cole, John M.: *See*—
Logan, Maurus C.; Cole, John M.; and Garner, Peter, 4,192,056, Cl. 29-468.000.
Stevens, John M.; Allen, Grant W.; Cole, John M.; and Mousseau, Timothy K., 4,192,992, Cl. 219-494.000.
Coleman Company, Inc., The: *See*—
Hill, Max L., 4,192,542, Cl. 296-173.000.
Coleman, James H., to Sprague Electric Company. Monolithic ceramic capacitor with fuse link. 4,193,106, Cl. 361-275.000.
Collins, Marcus H.; and Smith, John K., to Eaton Corporation. Fluid expandable tire building drum with shoe means attached thereto to form a tire building surface. 4,192,702, Cl. 156-416.000.
Collins, Vernon K.: *See*—
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,192,916, Cl. 435-274.000.
Collum, Paulette: *See*—
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,192,867, Cl. 424-180.000.
Colombo, Arthur F.; and Hopstock, David M., to United States of America, Interior. Process for scavenging iron from tailings produced by flotation beneficiation and for increasing iron ore recovery. 4,192,738, Cl. 209-5.000.
Combes, Marvin G., to Grove Valve and Regulator Company. One piece seat ring with O-ring seal. 4,192,483, Cl. 251-172.000.
Combustion Engineering Inc.: *See*—
Anthony, Andrew J., 4,192,716, Cl. 176-78.000.
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Blanchard, Bruno; Legressus, Claude; Massignon, Daniel; Sopizet, Rene; and Stefani, Rene, 4,193,003, Cl. 250-492.00A.
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Jankowski, Joseph, Jr., 4,192,979, Cl. 179-170.200.
Compagnie Generale pour les Developpements: *See*—
Michel, Dominique; and Noblanc, Alain G. N., 4,192,110, Cl. 52-111.000.
Computer Peripherals, Inc.: *See*—
Moore, Donn F., 4,192,055, Cl. 29-281.400.
Concept Development Institute, Inc.: *See*—
Morgan, Burton D., 4,192,105, Cl. 52-2.000.
Conoco, Inc.: *See*—
Torres, Julio A., 4,192,517, Cl. 277-24.000.
Conroy, Michael F., to Federal Paper Board Company, Inc. Container closure assembly. 4,192,434, Cl. 220-306.000.
Cook, Kenneth J.: *See*—
Massa, Richard L.; and Cook, Kenneth J., 4,193,039, Cl. 328-162.000.
Cooper, George R., to Purdue Research Foundation. Method of signal transmission and reception utilizing wideband signals. 4,193,031, Cl. 455-38.000.
Cooper, Glenn F.; and Enemark, Robert B., to American District Telegraph Company. Latching alarm smoke detector. 4,193,069, Cl. 340-630.000.
Copal Company Limited: *See*—
Wakazono, Kenji; Ishiguro, Yasuo; and Saito, Toshihisa, 4,192,595, Cl. 354-133.000.
Corgier, Monique M.: *See*—
Brown, Eric; Boschetti, Egisto; Corgier, Monique M.; and Touet, Joel, 4,192,784, Cl. 260-8.000.
Corning Glass Works: *See*—
Chyung, Kenneth; and Megles, John E., Jr., 4,192,665, Cl. 65-33.000.
Cornou, Jean, to Allibert Exploitation, Societe Anonyme. Laterally openable storage and transport box. 4,192,430, Cl. 220-1.500.
Cory Food Services, Inc.: *See*—
Petry, Stanton H., 4,192,227, Cl. 99-279.000.
Coules, Ronald A., to Richco Plastic Company. Quarter turn circuit board guide. 4,192,478, Cl. 248-222.300.
Counts, William H., to Admiral Corporation. Bias boost circuit for television receiver. 4,193,094, Cl. 358-190.000.
Courtright, Burr, to CH_2O, Inc. Agricultural irrigation system and components therefor. 4,192,340, Cl. 137-344.000.
Cousse, Henri; Bonnaud, Bernard; Tarayre, Jean-Pierre; and Casadio, Silvano, to Pierre Fabre, S.A. Amides of pyrrolidinoethylamine which can be used in lung therapy. 4,192,883, Cl. 424-274.000.
Coval, Arthur B.: *See*—
Lee, Arthur L.; and Coval, Arthur B., 4,192,405, Cl. 188-170.000.
Cox, Bruce M.; and Ho, Morris D., to Halliburton Company. Mass flowmeter. 4,192,184, Cl. 73-194.00B.
Crawford, James F. X. Horizontal auxiliary sleeper door. 4,192,543, Cl. 296-159.000.
Crede, Helfried. Process for the recovery of energy and in particular for the recovery of heat on the heat pump principle. 4,192,146, Cl. 62-2.000.
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Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.
Crickard, James L.; and Sheets, Harold L., to Huntington Alloys, Inc. Apparatus and method for pressure testing of tubular bodies. 4,192,177, Cl. 73-49.500.
Crivello, James V., to General Electric Company. Method of foaming curable organic resin compositions. 4,192,924, Cl. 521-126.000.
Croitoriu, Jean-Claude: *See*—
Lobermann, Claude; and Croitoriu, Jean-Claude, 4,192,174, Cl. 73-19.000.
Crossman, Richard L., to Goodyear Aerospace Corporation. Brake adjuster with internal swage. 4,192,407, Cl. 188-196.00R.
Crouzet: *See*—
Jouret, Edouard, 4,192,198, Cl. 74-384.000.
Crow, Dennis W.; and Kreger, William E. Racquet game exerciser. 4,192,500, Cl. 272-68.000.
Croy, David G., to Cameron Iron Works, Inc. Subsea production chamber. 4,192,384, Cl. 166-356.000.
Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A: *See*—
Bertoglio, Ottavio; Caccia, Aurelio; Fidanza, Riccardo; and Van-Veen, Wouter M. D., 4,192,972, Cl. 179-6.30R.
Cubic Corporation: *See*—
En, John, 4,193,062, Cl. 371-43.000.
Curtis Instruments, Inc.: *See*—
Finger, Eugene P.; and Sands, Eugene A., 4,193,026, Cl. 324-428.000.
Curutchet, Pedro D. Surgical instruments. 4,192,314, Cl. 128-322.000.
Cushman, David W.: *See*—
Ondetti, Miguel A.; and Cushman, David W., 4,192,881, Cl. 424-273.00R.
Ondetti, Miguel A.; and Cushman, David W., 4,192,882, Cl. 424-274.000.
Custom Moulders (Proprietary) Limited: *See*—
Urzi, Santi T., 4,192,257, Cl. 119-81.000.
Cykowski, Mark F., to Burroughs Corporation. Keyboard interrupt method and apparatus. 4,193,113, Cl. 364-200.000.
Cyprus Metallurgical Processes Corporation: *See*—
Reynolds, James E.; Hazen, Wayne C.; and Goens, Duane N., 4,192,676, Cl. 75-72.000.
Dafler, James R.: *See*—
Pangborn, Jon B.; and Dafler, James R., 4,192,726, Cl. 204-129.000.

Dai Nippon Toryo Co, Ltd.: *See*—
Yaguchi, Masachika; and Kato, Haruhiro, 4,192,581, Cl. 350-357.000.

Dailey, Alvin. Variable gear ratio transmission. 4,192,203, Cl. 74-863.000.

Daimler-Benz Aktiengesellschaft: *See*—
Haberle, Fritz; and Kurth, Hermann W., 4,192,039, Cl. 16-86.00B.

Dalborg, Astrid T. P.: *See*—
Bergstrom, John R.; Hultman, Bengt G.; and Dalborg, Astrid T. P., 4,192,708, Cl. 162-49.000.

Dales, Mark J., to Rohm and Haas Company. Crosslinked gel ion exchange resin beads characterized by strain birefringence patterns. 4,192,921, Cl. 521-38.000.

Dam, Naim G.; and Landau, Monroe A., to Bios Inc. Method and apparatus for locating the QRS portion of an electrocardiographic signal. 4,192,318, Cl. 128-708.000.

Damon, Ralph S. Diesel fueled engine coolant heater. 4,192,274, Cl. 123-142.50R.

Dana Corporation: *See*—
Otteson, Jack O.; and Martin, Eugene J., 4,192,399, Cl. 180-170.000.

Danfoss A/S: *See*—
Rasmussen, Hans C.; and Hallgreen, Knud J., 4,192,455, Cl. 237-8.00R.

Dantzer, Elonne: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin, deceased; Benkoe, Elisabeth, Executrix; and Dantzer, Elonne, 4,192,092, Cl. 46-123.000.

Dardoufas, Kimon C.: *See*—
Marshall, Robert M.; and Dardoufas, Kimon C., 4,192,754, Cl. 252-8.800.

Dartoy, Jacques: *See*—
Derouette, Jean-Jacques; Dartoy, Jacques; Fournier, Jacques; and Vollerin, Bernard, 4,192,371, Cl. 165-1.000.

Davies, Jenkin E.: *See*—
van Dijk, Jan; and Davies, Jenkin E., 4,192,818, Cl. 260-566.0AE.

Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., to Washington University; and Albany International Corporation. Heart valve prosthesis. 4,192,020, Cl. 3-1.500.

Daws, Lee F., to Canada, Her Majesty the Queen in right of. Collapsible dome frame. 4,192,334, Cl. 135-4.00R.

Deaton, Ion V.; and Horman, Frederick H., to Singer Company, The. Electronic warfare simulator. 4,192,082, Cl. 35-10.400.

Deaver, Don A.; and Sterrett, Dale E., to Tenneco Inc. Complete louver flow muffler. 4,192,401, Cl. 181-266.000.

Decaro, Charles J., to Textron Inc. Rail anchoring system. 4,192,459, Cl. 238-356.000.

DeCicco, Michael A.: *See*—
Langan, John P.; and DeCicco, Michael A., 4,192,150, Cl. 62-277.000.

Decky, John R.; and Meyer, Bruno P. Pipe-wall stud connector. 4,192,477, Cl. 248-56.000.

Deeks, Daniel H., to Deeks, Daniel H. Process for treating sewage effluent. 4,192,741, Cl. 210-6.000.

Deere & Company: *See*—
Haverdink, Virgil D.; and Landry, Henry J., Jr., 4,192,386, Cl. 171-58.000.
Lawrence, Allan K.; Bass, Merlyn D.; Black, Robert D.; and Krafka, Jerry L., 4,192,468, Cl. 241-101.700.
Salem, Robert J., 4,193,049, Cl. 333-141.000.
Stecklein, Gary L., 4,192,622, Cl. 403-146.000.
Wilson, John E., 4,192,322, Cl. 130-27.00T.

Defourneaux, Robert P., Jr. Bottom valve tripping and liquid channeling device for an automated bailer of shallow wells. 4,192,377, Cl. 166-70.000.

Degremont S.A.: *See*—
Bernard, Jacques; Bebin, Jean; and Hazard, Jean-Pierre, 4,192,742, Cl. 210-17.000.

Dehnert, Heinz: *See*—
Korber, Elmar; and Dehnert, Heinz, 4,192,321, Cl. 128-776.000.

Deibig, Heinrich; Heide, Helmut; Reiner, Roland; and Koster, Kari, to Batelle-Institut e.V. Bone replacement or prosthesis anchoring material. 4,192,021, Cl. 3-1.900.

Delmotte, Philippe M.: *See*—
Richard, Andre J.; Delmotte, Philippe M.; and Parthoens, Pierre A., 4,192,120, Cl. 52-741.000.

de Mello Ribeiro Pinto, Luiz A. C. Continuous decantation clarifier for liquids containing suspended solids. 4,192,752, Cl. 210-298.000.

deMey, Charles F., II; and Helms, Charles C., to Perkin-Elmer Corporation, The. L/C detector cell assembly. 4,192,614, Cl. 356-410.000.

Dempsey, Douglas E.: *See*—
Tabickman, Maurice L.; and Dempsey, Douglas E., 4,192,505, Cl. 273-73.00C.

Dennison Manufacturing Company: *See*—
Bone, Arnold R., 4,192,358, Cl. 140-123.600.

Derouette, Jean-Jacques; Dartoy, Jacques; Fournier, Jacques; and Vollerin, Bernard, to Battelle Memorial Institute; and Agence Nationale de Valorisation de la Recherche (ANVAR). Process for supplying thermal energy for an endothermic reaction from a source not available at the reaction site. 4,192,371, Cl. 165-1.000.

Desenberg, Charles: *See*—
Wolfson, Joseph, 4,192,068, Cl. 433-3.000.

Detexomat Machinery Limited: *See*—
Haselgrove, Bob; and Nichol, John D., 4,192,242, Cl. 112-262.200.

Deuterium Corporation: *See*—
Spevack, Jerome S., 4,192,847, Cl. 422-198.000.
Spevack, Jerome S., 4,192,850, Cl. 422-255.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Formant filter synthesizer for an electronic musical instrument. 4,192,210, Cl. 84-1.010.

Devers, John C. Bandage with integrated applicator. 4,192,300, Cl. 128-155.000.

Dewhirst, William: *See*—
O'Neil, John B.; and Dewhirst, William, 4,192,127, Cl. 57-7.000.

Dezawa, Katsumi: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.

Diamond Shamrock Corporation: *See*—
Dotson, Ronald L.; and O'Leary, Kevin J., 4,192,725, Cl. 204-98.000.

Dicey Fabrics, Inc.: *See*—
Peeler, Burin A.; and Neisler, Henry P., 4,192,355, Cl. 139-435.000.

Di Ciaccio, James J., to Dynamics Research Corporation. Gaging system with pivotable gage bar. 4,192,168, Cl. 72-389.000.

Dickey, Charles R.; and Williamson, Paul M., to Bray Oil Company, Inc. Overbased magnesium sulfonate process. 4,192,758, Cl. 252-33.000.

Dickey-john Corporation: *See*—
Funk, David B., 4,193,116, Cl. 364-556.000.

Dickie, Ray A.; Holubka, Joseph W.; and Chattha, Mohinder S., to Ford Motor Company. Alkaline resistant organic coatings for corrosion susceptible substrates IV. 4,192,932, Cl. 525-511.000.

Didier-Werke AG: *See*—
Bade, Werner; Gelsdorf, Gunther; and Wieland, Gunther, 4,192,687, Cl. 106-38.240.

Diehm, Hans: *See*—
Meissner, Bernd; Fliege, Werner; Woerz, Otto; Dudeck, Christian; and Diehm, Hans, 4,192,820, Cl. 260-601.00R.

Dieterich, Dieter, to Bayer Aktiengesellschaft. Modified polyisocyanates containing sulfonic acid ester groups. 4,192,938, Cl. 528-67.000.

Dietz, Wolfgang F. W., to RCA Corporation. Deflection circuit. 4,193,018, Cl. 315-408.000.

Dits, Herbert R., to Transform Verstarkungsmaschinen Aktiengesellschaft. Power piston apparatus. 4,192,222, Cl. 91-517.000.

Dmitrenko, Valentina V.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

Dr. Boy KG: *See*—
Spanier, Hermann, 4,192,616, Cl. 366-79.000.

Dr. L. ° Zambeletti S.p.A.: *See*—
Botre, Claudio; Bolasco, Franco; Memoli, Adriana; and Molteni, Luigi, 4,192,894, Cl. 424-329.000.

Dodson, Daniel P., to Eastman Kodak Company. Modified polyethylene containing hot-melt adhesives useful for carpet tape. 4,192,788, Cl. 260-27.00R.

Doi, Tatsuo: *See*—
Kazino, Sadayosi; and Doi, Tatsuo, 4,192,195, Cl. 74-7.00A.

Dolgov, Sergei I.: *See*—
Vydrin, Vladimir N.; Barkov, Leonid A.; Pastukhov, Valery V.; Dolgov, Sergei I.; and Sysoev, Vladimir S., 4,192,165, Cl. 72-238.000.

Donaldson, Willis L.: *See*—
Prucha, Martin J.; Donaldson, Willis L.; and Travers, Douglas N., 4,192,967, Cl. 178-22.000.

Dornbush, David A.: *See*—
Erickson, Chad S.; and Dornbush, David A., 4,192,081, Cl. 34-225.000.

Dorosh, Michael. Stud extractor. 4,192,205, Cl. 81-53.200.

Dosapro Milton Roy: *See*—
Lombard, Didier, 4,192,223, Cl. 92-5.00R.

Dotson, Ronald L.; and O'Leary, Kevin J., to Diamond Shamrock Corporation. Electrolytic production of high purity alkali metal hydroxide. 4,192,725, Cl. 204-98.000.

Dougherty, Thomas J.: *See*—
Frailing, Charles E.; and Dougherty, Thomas J., 4,193,025, Cl. 324-427.000.

Dougherty, Walter S., to United States of America, Health, Education and Welfare. System for creating motion effects employing still projection equipment. 4,192,584, Cl. 353-30.000.

Dougherty, William E., to International Business Machines Corporation. Multi-layer dielectric structure. 4,193,082, Cl. 357-80.000.

Dow Chemical Company, The: *See*—
Wagner, Eugene R.; and Matthews, Donald P., 4,192,884, Cl. 424-275.000.

Downs, Byron E., II, to Honeywell Inc. Eddy current instrumentation circuitry for distinguishing flaw signals from spurious noise signals. 4,193,028, Cl. 324-237.000.

Dragerwerk Aktiengesellschaft: *See*—
Bartscher, Wolfgang; Sachtler, Jurgen; and Schultner, Roland, 4,192,836, Cl. 261-142.000.

Dreher, George L., to Beloit Corporation. Combined breaker size press coater. 4,192,712, Cl. 162-265.000.

Dresser Industries, Inc.: *See*—
Marsh, Harry A., Jr., 4,192,492, Cl. 266-281.000.
Smith, John R. E., 4,192,380, Cl. 166-250.000.

DSO "Bulgarplod": *See*—
Krivoshiev, Georgi P., 4,192,999, Cl. 250-561.000.

Dube, Jacques: *See—*
Allais, Andre; Meier, Jean; and Dube, Jacques, 4,192,890, Cl. 424-308.000.
Duckworth, Charles E. Cooling system for internal combustion engine. 4,192,266, Cl. 123-119.00A.
Dudeck, Christian: *See—*
Meissner, Bernd; Fliege, Werner; Woerz, Otto; Dudeck, Christian; and Diehm, Hans, 4,192,820, Cl. 260-601.00R.
Duembgen, Gerd: *See—*
Broecker, Franz J.; Duembgen, Gerd; Glietenberg, Helmut; Miesen, Ernest; and Schwarzmann, Matthias, 4,192,807, Cl. 260-343.600.
Duhl, Daniel; and Wall, Denton B., to Polylok Corporation. Fabric and apparatus and method for making same. 4,192,160, Cl. 66-207.000.
Dumas, Daniel; Lacroix, Serge; and Vallon, Jean, to Societe des Electrodes et Refractaires Savoie. Carbonaceous luting paste and ambient temperature luting process. 4,192,730, Cl. 204-294.000.
Dumortier, Thierry M., to Fabrique Nationale Herstal, en abrege FN. Shell for sporting cartridge of plastic material. 4,192,233, Cl. 102-43.00P.
Dunbeker, George H.: *See—*
Trieschock, George E.; and Dunbeker, George H., 4,192,843, Cl. 264-528.000.
Dunlap, Harold E., to Thermo Electron Corporation. Creping doctor. 4,192,709, Cl. 162-111.000.
Duphar International Research B.V.: *See—*
van Dijk, Jan; and Davies, Jenkin E., 4,192,818, Cl. 260-566.0AE.
Du Pont de Nemours, E. I., and Company: *See—*
Adams, John B., Jr.; and Wommack, Joel B., Jr., 4,192,669, Cl. 71-108.000.
Beresniewicz, Aleksander; and Gallagher, John P., 4,192,826, Cl. 525-425.000.
MacDonald, Robert D., 4,192,052, Cl. 29-157.30A.
Robinson, Ivan M., 4,192,943, Cl. 528-417.000.
DuPont of Canada Limited: *See—*
Lovell, Peter J.; and Saunders, Ian C. B., 4,192,935, Cl. 526-348.600.
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Imidazolyl alkylamino nitroethylene compounds. 4,192,879, Cl. 424-273.00R.
Durbin, James. Concrete wall forming system. 4,192,481, Cl. 249-42.000.
Durley, Benton A., III. Ultrasonic piezoelectric transducer using a rubber mounting. 4,193,009, Cl. 310-323.000.
Duthweiler, Frederick C., to Union Oil Company of California. Method and apparatus for building ice islands. 4,192,630, Cl. 405-217.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Jungwirth, Dieter; Renoth, Josef; and Wlodkowski, Johann, 4,192,114, Cl. 52-230.000.
Dynamics Research Corporation: *See—*
Di Ciaccio, James J., 4,192,168, Cl. 72-389.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Gawlick, Heinz; Marondel, Gunter; and Siegelin, Werner, 4,192,837, Cl. 264-3.00E.
E. Beaudry & Cie, Societe Anonyme: *See—*
Jackson, Philip, 4,192,749, Cl. 210-107.000.
E. R. Squibb & Sons, Inc.: *See—*
Chen, James L.; Cilento, Rudolfo D.; Hill, John A.; and La Via, Anthony L., 4,192,785, Cl. 260-17.4GC.
Haslanger, Martin F., 4,192,891, Cl. 424-305.000.
Hauck, Frederic P.; Narayanan, Venkatachala L.; O'Connor, Jeremiah J.; and Pilote, Raymond R., 4,192,889, Cl. 424-309.000.
Mackaness, George B.; and Hou, Joseph P., 4,192,859, Cl. 424-5.000.
Ondetti, Miguel A., 4,192,878, Cl. 424-270.000.
Ondetti, Miguel A.; and Cushman, David W., 4,192,881, Cl. 424-273.00R.
Ondetti, Miguel A.; and Cushman, David W., 4,192,882, Cl. 424-274.000.
Ondetti, Miguel A., 4,192,945, Cl. 546-245.000.
E.T.I. Corporation: *See—*
Murphy, Wesley T., 4,192,119, Cl. 52-588.000.
Easterly, Herbert D. Auxiliary truck heater. 4,192,457, Cl. 237-12.30C.
Eastern Company, The: *See—*
Vass, George S., 4,192,631, Cl. 405-261.000.
Eastman Kodak Company: *See—*
Chasman, Richard A.; and Erickson, Wayne F., 4,192,678, Cl. 430-214.000.
Dodson, Daniel P., 4,192,788, Cl. 260-27.00R.
Erickson, Wayne F., 4,192,679, Cl. 430-214.000.
Foster, Charles H., 4,192,811, Cl. 260-397.250.
Hage, Charles T., 4,192,607, Cl. 355-50.000.
Mainord, Kenneth R., 4,192,942, Cl. 260-597.00R.
Wang, Richard H. S.; Irick, Gether, Jr.; and Ownby, James C., 4,192,794, Cl. 260-42.450.
Eaton Corporation: *See—*
Blazek, Gustav; and Charych, Arthur, 4,193,075, Cl. 343-108.00M.
Bogema, Edward J.; Vandervoort, John R.; and Bevins, John R., 4,192,196, Cl. 74-339.000.
Collins, Marcus H.; and Smith, John K., 4,192,702, Cl. 156-416.000.
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Company Limited. Portable electronic device. 4,192,135, Cl. 368-62.000.
Edcliff Instruments: *See—*
Avellis, Cosmo L.; Pavone, Carlo; and Wolfkamp, Albertus, 4,192,183, Cl. 73-182.000.
Edelman, Leonard E., to Westinghouse Electric Corp. Non-pulverulent solid polymeric structure. 4,192,933, Cl. 525-377.000.
Edouard Dubied & Cie (Societe Anonyme): *See—*
Kohler, Fritz, 4,192,156, Cl. 66-64.000.
Edwards, Jeffrey D.: *See—*
Stineman, Thomas L.; Edwards, Jeffrey D.; and Grosskopf, Jack C., 4,192,918, Cl. 435-256.000.
Edwards, Margaret P.: *See—*
Parker, William D.; Smith, Harry M.; and Edwards, Margaret P., 4,192,697, Cl. 156-188.000.
Eggineers, Inc.: *See—*
Caudle, Otis M., 4,192,121, Cl. 53-248.000.
EIC Corporation: *See—*
Harvey, Walter W.; and Makrides, Alkis C., 4,192,854, Cl. 423-220.000.
Eisenhauer, Marvin W.: *See—*
Kridler, Edward L.; Eisenhauer, Marvin W.; and Huson, Loyal A., 4,192,283, Cl. 126-25.0AA.
Ekstrom, Lars A., to Raywall Kommanditbolag. Windows. 4,192,111, Cl. 52-171.000.
Electric Power Research Institute, Inc.: *See—*
Barkan, Philip; and Imam, Imdad, 4,192,981, Cl. 200-144.00B.
Electrolytic Zinc Co. of Australasia Limited: *See—*
Pammenter, Robert V.; and Haigh, Curzon J., 4,192,852, Cl. 423-42.000.
Eletr, Sam H.: *See—*
Kronick, Melvyn N.; Bryson, Charles E., III; Bridgham, John A.; and Eletr, Sam H., 4,192,996, Cl. 250-373.000.
Elfes, Lee E.; and Wood, Dale A., to Massey-Ferguson Inc. Stackable filter head unit. 4,192,750, Cl. 210-133.000.
Eli Lilly and Company: *See—*
Soper, Quentin F., 4,192,670, Cl. 71-121.000.
Emerson Electric Co.: *See—*
Henton, Paul V.; and Fait, Roger J., 4,192,751, Cl. 210-136.000.
Emura, Tomoyuki: *See—*
Takahashi, Tsukasa; Sekihara, Takeshi; Emura, Tomoyuki; and Miki, Masayoshi, 4,192,934, Cl. 526-62.000.
En, John, to Cubic Corporation. Triple random error correcting convolutional code. 4,193,062, Cl. 371-43.000.
Enemark, Robert B.: *See—*
Cooper, Glenn F.; and Enemark, Robert B., 4,193,069, Cl. 340-630.000.
Energy Research Corporation: *See—*
Maru, Hansraj C., 4,192,906, Cl. 429-13.000.
English Electric Valve Company Limited: *See—*
Nixon, Ralph D., 4,193,014, Cl. 313-396.000.
Enjoji, Masahiko: *See—*
Ishidera, Takashi; and Enjoji, Masahiko, 4,192,660, Cl. 55-276.000.
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, to Taikisha Ltd.; Honda Motor Co., Ltd.; and Shinto Paint Co., Ltd. Method for supplying powder into a coating tank and its apparatus. 4,192,728, Cl. 204-181.00R.
Entreprises de Travaux Publics et Prives J. Richard Societe Anonyme: *See—*
Richard, Andre J.; Delmotte, Philippe M.; and Parthoens, Pierre A., 4,192,120, Cl. 52-741.000.
Erickson, Chad S.; and Dornbush, David A., to Alternative Pioneering Systems, Inc. Food dehydrating machine. 4,192,081, Cl. 34-225.000.
Erickson, Elwyn J. Shielded spray apparatus. 4,192,462, Cl. 239-288.000.
Erickson, Erick E.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board game apparatus. 4,192,512, Cl. 273-243.000.
Erickson, Norman. Dental appliance. 4,192,071, Cl. 433-93.000.
Erickson, Wayne F., to Eastman Kodak Company. Bifunctional benzisoxazolone compounds. 4,192,679, Cl. 430-214.000.
Erickson, Wayne F.: *See—*
Chasman, Richard A.; and Erickson, Wayne F., 4,192,678, Cl. 430-214.000.
Ernst Leitz Wetzlar GmbH: *See—*
Henkelmann, Kurt; and Bruckner, Dietrich, 4,192,585, Cl. 353-101.000.
Escher Wyss GmbH: *See—*
Bubik, Alfred; Jox, Rainer; and Schultz, Hans-Joachim, 4,192,710, Cl. 162-198.000.
Esposito, Ralph H., to Honeywell Inc. Electrical contact for conductive-backed paper. 4,193,078, Cl. 346-76.00R.
Essex Transducers Corporation: *See—*
Kompanek, Harry W., 4,193,010, Cl. 310-330.000.
Etablissements Francois Salomon et Fils: *See—*
Salomon, Georges P. J., 4,192,087, Cl. 36-119.000.
Etablissements Unicor: *See—*
Brodin, Eric, 4,192,310, Cl. 126-286.000.
Etoh, Yukihiro: *See—*
Iizuka, Haruhiko; Sugasawa, Fukashi; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,192,278, Cl. 123-198.00F.
Ettenhofer, Kurt L.: *See—*
Wiggins, Robert W.; Ettenhofer, Kurt L.; and Bess, Jack, 4,193,129, Cl. 367-106.000.
Exxon Research & Engineering Co.: *See—*
Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,192,735, Cl. 208-112.000.
Bucker, Edward R.; and Amick, James A., 4,192,720, Cl. 204-14.00N.
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,192,780, Cl. 252-518.000.

McVicker, Gary B.; and Vannice, M. Albert, 4,192,777, Cl. 252-447.000.
O'Neil, John B.; and Dewhirst, William, 4,192,127, Cl. 57-7.000.
Oswald, Alexis A.; and Valint, Paul L., Jr., 4,192,829, Cl. 260-948.000.
Rao, Bhaskara M. L., 4,192,912, Cl. 429-105.000.
Smith, Hosea E., 4,192,515, Cl. 277-11.000.
Worley, Arthur C., 4,192,188, Cl. 73-424.000.

Fabrique Nationale Herstal, en abrege FN: *See*—
Dumortier, Thierry M., 4,192,233, Cl. 102-43.00P.

Fadeev, Alexandr I.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.

Fait, Roger J.: *See*—
Henton, Paul V.; and Fait, Roger J., 4,192,751, Cl. 210-136.000.

Falcioni, Joseph G., to Boeing Company, The. High fatigue slug squeeze riveting process using fixed upper clamp and apparatus therefor. 4,192,058, Cl. 29-526.00A.

Fargo Machine & Tool Company: *See*—
Fortunski, Anthony C.; and Gentry, Everett G., 4,192,615, Cl. 366-65.000.

Farmland Industries, Inc.: *See*—
Wickstrom, Lawrence L.; and Garden, Jock C., 4,192,107, Cl. 52-82.000.

Farncomb, Robert E.; Mueller, Kurt F.; and Wagaman, Kerry L., to United States of America, Navy. Method for producing hydrazines by reacting chloramine with ammonia or amines. 4,192,819, Cl. 260-583.00N.

Farquhar, Bannister W.; and Sloan, Denis, to Boeing Company, The. Noise suppression refracting inlet for jet engines. 4,192,336, Cl. 137-15.100.

Fawcett, William R.; and Baranski, Andrzej S. Method for producing a smooth coherent film of a metal chalconide. 4,192,721, Cl. 204-14.00N.

Fay, William L., to Visor-Trac, Inc. Visored headgear. 4,192,017, Cl. 2-12.000.

Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, to S.A. Manganese Amcor Ltd.; and Creusot-Loire. Process for decarburizing ferro-manganese. 4,192,675, Cl. 75-60.000.

Federal Paper Board Company, Inc.: *See*—
Conroy, Michael F., 4,192,434, Cl. 220-306.000.

Fedida, Samuel; and Sargent, Desmond J., to Post Office. Information handling apparatus having multiple ports distributed around shifting register rings. 4,193,121, Cl. 364-900.000.

Feecon Corporation: *See*—
Pierce, Leo P., 4,192,385, Cl. 169-56.000.

Feeley, John M.; and Feeley, Ruth E. Diamond alphabet playing cards. 4,192,513, Cl. 273-294.000.

Feeley, Ruth E.: *See*—
Feeley, John M.; and Feeley, Ruth E., 4,192,513, Cl. 273-294.000.

Feldman, Michael A. Soft contact lens apparatus. 4,192,204, Cl. 81-43.000.

Feldmeier, Robert H. Vertical liquid storage tank and apparatus for cleaning. 4,192,332, Cl. 134-167.00R.

Felfoldi, James J. Disposable diaper with wetness indicator. 4,192,311, Cl. 128-287.000.

Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, to AGFA-Gevert, A.G. Method and apparatus for making color prints. 4,192,605, Cl. 355-38.000.

Ferneau, Richard H., to Weil, Burt. Cart having extensible auxiliary wheels. 4,192,541, Cl. 296-20.000.

Ferranti Limited: *See*—
Walters, Frank, 4,193,017, Cl. 315-169.400.

Ferrari, Lorenzo: *See*—
Bruzzese, Tiberio; and Ferrari, Lorenzo, 4,192,864, Cl. 424-122.000.

Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, to La Spirotechnique Industrielle et Commerciale; Technisub S.p.A.; and Carros Industries (T Alpes Maritimes). Breathing apparatus with improved regulator particularly for under water use. 4,192,298, Cl. 128-205.240.

Ferrini, Pier G.; Goschke, Richard; Sallmann, Alfred; and Rossi, Alberto, to Ciba-Geigy Corporation. Anti-inflammatory 2-sulphonyl-(or -sulphinyl)-2-aminoacetophenones. 4,192,873, Cl. 424-246.000.

Ferwagner, Josef. Drawing die for making a pipe elbow. 4,192,170, Cl. 72-414.000.

Fesler, John C.; and Bell, Dennis M., to International Tapetronics Corporation. Magnetic transducer head. 4,193,103, Cl. 360-122.000.

Fidanza, Riccardo: *See*—
Bertoglio, Ottavio; Caccia, Aurelio; Fidanza, Riccardo; and Van-Veen, Wouter M. D., 4,192,972, Cl. 179-6.30R.

Fiege, Helmut: *See*—
Bauer, Kurt; Krempel, Alfred; Molleken, Reiner; Wedemeyer, Karlfried; and Fiege, Helmut, 4,192,959, Cl. 568-764.000.

Filtrol Corporation: *See*—
Alafandi, Hamid; and Stamires, Dennis, 4,192,778, Cl. 252-455.00Z.

Finan, Michael A.: *See*—
Clark, David R.; Marshall, Alan; and Finan, Michael A., 4,192,744, Cl. 210-54.000.

Findeis, Gunter: *See*—
Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,192,605, Cl. 355-38.000.

Findeisen, Kurt: *See*—
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,925, Cl. 521-163.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,926, Cl. 521-163.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,927, Cl. 521-165.000.

Findley, Charles A. Log splitting device. 4,192,364, Cl. 144-193.00A.

Finger, Eugene P.; and Sands, Eugene A., to Curtis Instruments, Inc. Method and apparatus for measuring the state of charge of a battery by monitoring reductions in voltage. 4,193,026, Cl. 324-428.000.

Firmenich SA: *See*—
Naf, Ferdinand, 4,192,781, Cl. 252-522.00R.

Firth, George F.: *See*—
Hayden, Owen; Sheward, George E.; Ormrod, Derek T.; Willby, Christopher R.; and Firth, George F., 4,192,374, Cl. 165-158.000.

Fischer, John P. Tile cutter. 4,192,282, Cl. 125-23.00T.

Fischer, Paul W.: *See*—
Pye, David S.; Gallus, Julius P.; and Fischer, Paul W., 4,192,753, Cl. 252-8.50A.

Fisher, John M., to B. F. Goodrich Company, The. Valve assembly. 4,192,339, Cl. 137-223.000.

Fisher, Leslie G., to GKN Transmissions Limited. Hookes joint yoke. 4,192,153, Cl. 64-17.00R.

Fisons Limited: *See*—
Griffiths, Alan J., 4,192,860, Cl. 424-43.000.
Towlerton, Richard G.; and Lapras, Michel, 4,192,886, Cl. 424-283.000.

Fitzgerald, Denis E. Portable miniature golf game. 4,192,511, Cl. 273-176.00G.

Fitzpatrick, Francis A., to Upjohn Company, The. Conjugates formed by reacting a prostaglandin mimic compound with a carrier molecule. 4,192,799, Cl. 260-121.000.

Fliege, Werner: *See*—
Meissner, Bernd; Fliege, Werner; Woerz, Otto; Dudeck, Christian; and Diehm, Hans, 4,192,820, Cl. 260-601.00R.

Florindez, Augusto. Automatic bag supplying machine for bread baggers. 4,192,122, Cl. 53-572.000.

Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., to Texaco Inc. Process for recovering hydrocarbons from a hydrocarbon bearing formation. 4,192,755, Cl. 252-8.55D.

Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., to Texaco Inc. Aqueous surfactant solutions and oil-in-water emulsions. 4,192,767, Cl. 252-312.000.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-substituted prostanoic acids and congeners. 4,192,950, Cl. 562-500.000.

FMC Corporation: *See*—
Chang, Andrew K., 4,192,074, Cl. 33-228.000.
Wech, Robert J., 4,192,705, Cl. 156-515.000.

Fogel, Isaac, to Classic Corporation. Waterbed mattress. 4,192,031, Cl. 5-451.000.

Fogelberg, Mark J., to Borg-Warner Corporation. Automatic locking clutch. 4,192,411, Cl. 192-36.000.

Folz, Walter C.: *See*—
Cioccio, Armand; and Folz, Walter C., 4,193,029, Cl. 324-301.000.

Ford Motor Company: *See*—
Dickie, Ray A.; Holubka, Joseph W.; and Chattha, Mohinder S., 4,192,932, Cl. 525-511.000.
Gandhi, Haren S.; Watkins, William L.; and Stepien, Henryk K., 4,192,779, Cl. 252-470.000.
Topouzian, Armenag, 4,192,911, Cl. 429-104.000.
Wingfield, Robert C., Jr., 4,192,929, Cl. 525-110.000.

Fortunato, James M.: *See*—
Glamkowski, Edward J.; and Fortunato, James M., 4,192,874, Cl. 424-248.540.

Fortunski, Anthony C.; and Gentry, Everett G., to Fargo Machine & Tool Company. Sand mulling machine plow. 4,192,615, Cl. 366-65.000.

Foster, Charles H., to Eastman Kodak Company. Process for separating stigmasterol-derived products. 4,192,811, Cl. 260-397.250.

Foster, Edward H.; and Reiss, James M., to Atomic Products Corporation. Device for delivering radioactive gas from a sealed vial. 4,192,438, Cl. 222-5.000.

Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, to John Heathcoat & Company Limited. Method of treating multifilament synthetic yarn. 4,192,047, Cl. 28-220.000.

Foster Wheeler Energy Corporation: *See*—
Wolowodiuk, Walter, 4,192,373, Cl. 165-70.000.

Foto-Mark, Inc.: *See*—
Pederson, Paul D., Jr.; Ufford, Keith A.; and Nelson, Lawrence V., 4,192,988, Cl. 219-201.000.

Fournier, Jacques: *See*—
Derouette, Jean-Jacques; Dartoy, Jacques; Fournier, Jacques; and Vollerin, Bernard, 4,192,371, Cl. 165-1.000.

Fowler, Harold W.: *See*—
Hodges, Frank P.; Fowler, Harold W.; and Anderson, Phillip R., 4,192,246, Cl. 114-23.000.

Fowlerex Pty. Limited: *See*—
Hood, Maxwell G., 4,192,745, Cl. 210-66.000.

Frailing, Charles E.; and Dougherty, Thomas J., to Globe-Union, Inc. Automatic battery analyzer. 4,193,025, Cl. 324-427.000.

Frank, Robert I.: *See*—
Kaplow, Roy; and Frank, Robert I., 4,193,081, Cl. 357-30.000.

Frankel, Robert S. Camera quadripod. 4,192,601, Cl. 354-293.000.

Frankenberg, Alfred A., to Robertshaw Controls Company. Thermostat construction and method of making the same. 4,192,453, Cl. 236-87.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,192,237, Cl. 104-7.00B.

Frassek, Karl H.: *See*—
Beck, Heinz; Frassek, Karl H.; Holtvoigt, Werner; and Mukerjee, Ambar, 4,192,930, Cl. 525-227.000.

Freakes, Anthony: *See*—
Baselice, Louis R.; Freakes, Anthony; Miller, Joseph A.; and Ventz, George A., 4,192,496, Cl. 271-10.000.

Freeman, Frank H.: *See*—
Madhavan, Narayanan; and Freeman, Frank H., 4,192,795, Cl. 260-42.520.

Freidinger, Roger M.: *See*—
Veber, Daniel F.; and Freidinger, Roger M., 4,192,875, Cl. 424-256.000.

Frezza, Robert, to Samcoe Holding Corporation. Adjustable spreader for tubular knitted fabric. 4,192,045, Cl. 26-75.000.

Friebe, Herbert, deceased; by Robert, Axel, administrator; and Reininghaus, Ulrich. Mine prop construction. 4,192,479, Cl. 248-354.00H.

Friedrich, Horst: *See*—
Sedlak, Adolf; and Friedrich, Horst, 4,192,132, Cl. 368-160.000.

Friedrich Kocks GmbH & Company: *See*—
Brauer, Hans, 4,192,164, Cl. 72-234.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Oya, Hiroo; and Tatejima, Masakazu, 4,192,846, Cl. 422-168.000.

Fuji Photo Film Co., Ltd.: *See*—
Kato, Hisashi; Iwasa, Masakazu; and Kudo, Yoshio, 4,192,232, Cl. 101-426.000.
Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, 4,192,594, Cl. 354-90.000.

Fuji Photo Optical Co., Ltd.: *See*—
Suzuki, Masane; and Yasuda, Kenzi, 4,192,578, Cl. 350-320.000.

Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Sealed type hydraulic reservoir. 4,192,345, Cl. 137-572.000.

Fujisawa, Isao: *See*—
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.

Fujita, Hisashi: *See*—
Masuzima, Sho; and Fujita, Hisashi, 4,192,061, Cl. 29-854.000.

Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Process for forming an amplified dye image. 4,192,681, Cl. 430-373.000.

Fukuda, Hideo: *See*—
Hashimoto, Noboru; Fukuda, Hideo; and Shibata, Setsuo, 4,192,833, Cl. 261-36.00R.

Fukuda, Tamotsu: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,192,268, Cl. 123-119.0EC.

Fuller, William D.: *See*—
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,192,798, Cl. 260-112.50R.

Funk, David B., to Dickey-john Corporation. Analysis instrument. 4,193,116, Cl. 364-556.000.

Furuya, Mikihito, to Nippon Kogaku K.K. Switch mechanism for a motor driven device. 4,192,599, Cl. 354-173.000.

Fushiki, Isamu; Kamitakahara, Atushi; and Mori, Keiichi, to Konishiroku Photo Industry Co., Ltd. Process for treating light-sensitive silver halide color photographic material. 4,192,680, Cl. 430-380.000.

Futamoto, Masaaki; Kawabe, Ushio; Hosoki, Shigeyuki; Komoda, Tsutomu; and Yamamoto, Shigehiko, to Hitachi, Ltd. Cathode for an electron source and a method of producing the same. 4,193,013, Cl. 313-341.000.

GAF Corporation: *See*—
Nahta, Roop C., 4,192,648, Cl. 8-86.000.

Gageur, Fritz; and Trotscher, Gerhard, to Lindauer Dornier Gesellschaft mbH. Device for treating a sheet of material partially enclosing a backing roll or a cooling cylinder. 4,192,251, Cl. 118-63.000.

Gale, Paul E.; and Toth, Endre L., to Arcair Company. Apparatus for generating and using a magnetic tape to control movement of a co-ordinate drive tool carriage. 4,193,021, Cl. 318-568.000.

Galey, Jean: *See*—
Gilbert, Ghislain; Bentz, Gerard; and Galey, Jean, 4,192,147, Cl. 62-49.000.

Gallagher, John P.: *See*—
Beresniewicz, Aleksander; and Gallagher, John P., 4,192,826, Cl. 525-425.000.

Gallus, Julius P.: *See*—
Pye, David S.; Gallus, Julius P.; and Fischer, Paul W., 4,192,753, Cl. 252-8.50A.

Gandhi, Haren S.; Watkins, William L.; and Stepien, Henryk K., to Ford Motor Company. Catalyst system and method for increasing the selectivity of a catalyst. 4,192,779, Cl. 252-470.000.

Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,192,879, Cl. 424-273.00R.

Gankin, Viktor J.: *See*—
Polyakov, Sergei A.; Shapiro, Aron L.; and Gankin, Viktor J., 4,192,961, Cl. 585-319.000.

Ganslaw, Stuart H.: *See*—
Micchelli, Albert L.; Nowak, Frank A., Jr.; and Ganslaw, Stuart H., 4,192,861, Cl. 424-47.000.

Garden, Jock C.: *See*—
Wickstrom, Lawrence L.; and Garden, Jock C., 4,192,107, Cl. 52-82.000.

Garmon, Ivan E., to Champion International Corporation. Four cell box and blank therefor. 4,192,444, Cl. 229-28.00R.

Garner, Peter: *See*—
Logan, Maurus C.; Cole, John M.; and Garner, Peter, 4,192,056, Cl. 29-468.000.

Gas-Fired Products, Inc.: *See*—
Horne, William P., 4,192,323, Cl. 131-135.000.

Gas Research Institute: *See*—
Pangborn, Jon B.; and Dafler, James R., 4,192,726, Cl. 204-129.000.

Gass, Jacques: *See*—
Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, 4,192,298, Cl. 128-205.240.

Gauthier, Roland. Clothes line device. 4,192,426, Cl. 211-105.400.

Gawlick, Heinz; Marondel, Gunter; and Siegelin, Werner, to Dynamit Nobel Aktiengesellschaft. Caseless propellant charge. 4,192,837, Cl. 264-3.00E.

Gehring, Johann: *See*—
Scheubeck, Egmont; and Gehring, Johann, 4,192,849, Cl. 422-242.000.

Geier, James M. Rocking chair frame. 4,192,547, Cl. 297-452.000.

Gekhman, Boris S.: *See*—
Vasilevsky, Petr N.; Gekhman, Boris S.; Parfinenko, Ivan V.; Podgursky, Alfred M.; and Lazaretnik, Avram S., 4,192,294, Cl. 128-1.00R.

Gelsdorf, Gunther: *See*—
Bade, Werner; Gelsdorf, Gunther; and Wieland, Gunther, 4,192,687, Cl. 106-38.240.

General Corrugated Machinery Co., Inc.: *See*—
Baselice, Louis R.; Freakes, Anthony; Miller, Joseph A.; and Ventz, George A., 4,192,496, Cl. 271-10.000.

General Electric Company: *See*—
Barker, Henry P.; and Mitchell, Lawrence C., 4,192,954, Cl. 568-723.000.
Crivello, James V., 4,192,924, Cl. 521-126.000.
Herzner, Frederick C., 4,192,633, Cl. 416-221.000.
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., 4,192,842, Cl. 264-298.000.
Losert, Gerhard K., 4,192,564, Cl. 312-253.000.
MacLaury, Michael R., 4,192,956, Cl. 568-726.000.
MacLaury, Michael R., 4,192,957, Cl. 568-726.000.
Reinitz, Clayton W., 4,192,955, Cl. 568-724.000.
Webb, William M., 4,192,149, Cl. 62-151.000.

General Instrument Corporation: *See*—
Smith, Kent F., 4,193,126, Cl. 365-174.000.

General Motors Corporation: *See*—
Borlinghaus, Hans J., 4,192,161, Cl. 70-455.000.
Brown, Richard C., 4,192,431, Cl. 220-62.000.

General Signal Corporation: *See*—
Schnell, Werner J., 4,192,192, Cl. 73-715.000.
Schnell, Werner J., 4,192,193, Cl. 73-739.000.

General Time Corporation: *See*—
Robinson, Ralph C., 4,192,136, Cl. 368-222.000.

Genese, Joseph N., to Abbott Laboratories. Catheter placement assembly having axial and rotational alignment means. 4,192,306, Cl. 128-214.400.

Gensho, Takahashi; Masamitsu, Yanai; Masakazu, Kurihara; Yoneharu, Tanaka; and Kazuhiro, Suzuoki, to Asahi Kasei Kogyo Kabushiki Kaisha. Photosensitive compositions containing hydrogenated 1,2-polybutadiene. 4,192,684, Cl. 430-284.000.

Gentry, Everett G.: *See*—
Fortunski, Anthony C.; and Gentry, Everett G., 4,192,615, Cl. 366-65.000.

Georex Industries, Inc.: *See*—
Womack, D. Gene; and Hignight, Charles G., 4,192,393, Cl. 175-103.000.

Geraci, Fred. Contour sheet for a convertible sofa bed. 4,192,032, Cl. 5-497.000.

Gericke, Willem A.: *See*—
Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.

Gerigk, Gunter; Klendauer, Wolfgang; Pietruck, Horst; and Hammer, Klaus-Dieter, to Hoechst Aktiengesellschaft. Tubular packaging material. 4,192,904, Cl. 428-36.000.

Gersbach, John E., to International Business Machines Corporation. Simultaneous read/write cell. 4,193,127, Cl. 365-174.000.

Gersonde, Klaus: *See*—
Nicolau, Yves-Claude; and Gersonde, Klaus, 4,192,869, Cl. 424-199.000.

Gerstenmeier, Jurgen; Klotz, Hermann; and Leiber, Heinz, to Robert Bosch GmbH. Testing apparatus for an anti-lock control system. 4,192,180, Cl. 73-121.000.

Gerulis, Benedict R. Hydraulic lock-out device. 4,192,338, Cl. 137-106.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Beckman, Klaus; and Redemann, Richard, 4,192,471, Cl. 241-185.00R.
Von Viebahn, Hans E.; and Tengler, Julius, 4,192,632, Cl. 405-298.000.

Giannetti, Joseph P.; and Swift, Harold E., to Gulf Research and Development Company. Novel fuel compositions comprising upgraded solid and/or semi-solid material prepared from coal. 4,192,653, Cl. 44-51.000.

Gianni, Richard. Multi-level socket for an integrated circuit. 4,192,565, Cl. 339-17.0CF.

Gielnik, Harry, to Munchmeyer & Co. Apparatus for cutting open and cleaning the stomachs of small animals, for example poultry. 4,192,040, Cl. 17-11.000.

Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Holdown for attaching wood framing members to concrete foundations. 4,192,118, Cl. 52-714.000.

Gilbert, Ghislain; Bentz, Gerard; and Galey, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Arrangements for the controlled injection of cryogenic fluid. 4,192,147, Cl. 62-49.000.

Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., to Racal-Milgo, Inc. Microcomputer data display communication system with a hardwire editing processor. 4,193,112, Cl. 364-200.000.

Giner, Jose D.: *See—*
United States of America, National Aeronautics and Space Administration; Giner, Jose D.; and Cahill, Kathleen J., 4,192,910, Cl. 429-101.000.

Ginger, Edward A., to UOP Inc. Process for the simultaneous separation of sulfur and nitrogen oxides from a gaseous mixture. 4,192,855, Cl. 423-239.000.

Ginsburg, Sara: *See—*
Savarese, John J.; Kitz, Richard J.; and Ginsburg, Sara, 4,192,877, Cl. 424-258.000.

GKN Transmissions Limited: *See—*
Fisher, Leslie G., 4,192,153, Cl. 64-17.00R.

Glamkowski, Edward J.; and Fortunato, James M., to American Hoechst Corporation. Substituted 1,2,6,7-tetrahydroindolo[1,7-ab][1,5]benzodiazepines. 4,192,874, Cl. 424-248.540.

Glass, Roger W.; and Kuntze, Richard A., to Ontario Research Foundation. Heat treatment of chrysotile asbestos fibres. 4,192,707, Cl. 162-3.000.

Glaxo Laboratories Limited: *See—*
Phillipps, Gordon H.; May, Peter J.; and Ayres, Barry E., 4,192,871, Cl. 424-241.000.

Glietenberg, Helmut: *See—*
Broecker, Franz J.; Duembgen, Gerd; Glietenberg, Helmut; Miesen, Ernest; and Schwarzmann, Matthias, 4,192,807, Cl. 260-343.600.

Globe-Union, Inc.: *See—*
Frailing, Charles E.; and Dougherty, Thomas J., 4,193,025, Cl. 324-427.000.

Glover, Clarence C.: *See—*
Morrison, Steven; Lisle, Thomas K., Jr.; and Glover, Clarence C., 4,193,066, Cl. 340-347.0CC.

Glushakov, Sergei N.: *See—*
Sheludyakov, Viktor D.; Kirilin, Alexei D.; Mironov, Vladimir F.; Glushakov, Sergei N.; and Karpman, Yakov S., 4,192,815, Cl. 260-453.00P.

Godai, Tomokazu; Sugiyama, Tohru; Sugino, Morihiko; Kondo, Masaru; and Ogawa, Tsuneshi, to Kobe Steel, Ltd. Process and apparatus for measurement of diffusible hydrogen. 4,192,175, Cl. 73-19.000.

Godejahn, Jr. Gordan C.: *See—*
Khan, Mahboob; Godejahn, Jr. Gordan C.; Heimbigner, Gary L.; and Aghishian, Noubar A., 4,192,059, Cl. 29-571.000.

Goebel, Larry W., to Ray Goebel & Sons, Inc. Wheel rut closing device for irrigation system. 4,192,388, Cl. 172-463.000.

Goens, Duane N.: *See—*
Reynolds, James E.; Hazen, Wayne C.; and Goens, Duane N., 4,192,676, Cl. 75-72.000.

Goettl, Adam D. Automatic flushing and draining reservoir apparatus for evaporative coolers. 4,192,832, Cl. 261-36.00R.

Goldfarb, Adolph E.; Benkoe, Erwin, deceased; by Benkoe, Elisabeth, Executrix; and Dantzer, Elonne, to Goldfarb, Adolph E.; and Benkoe, Elisabeth, Executrix for Estate of Erwin Benkoe. Toy eating animal utilizing conveyor. 4,192,092, Cl. 46-123.000.

Goldie, Harry: *See—*
Carter, Philip S.; Stitzer, Steven N.; and Goldie, Harry, 4,193,047, Cl. 333-17.00L.

Goldman, Holliday L.; and Winther, Svend E., to Allis-Chalmers Corporation. Hydraulic actuator to provide both rotary and linear motions to a movable valve. 4,192,482, Cl. 251-56.000.

Gomolka, William. Electrical connector. 4,192,567, Cl. 339-75.00M.

Good, William R.: *See—*
Mueller, Karl F.; and Good, William R., 4,192,827, Cl. 525-123.000.

Goodman, Murray: *See—*
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,192,798, Cl. 260-112.50R.

Goodyear Aerospace Corporation: *See—*
Crossman, Richard L., 4,192,407, Cl. 188-196.00R.

Goodyear Tire & Rubber Company, The: *See—*
Henry, Brian, 4,192,351, Cl. 138-126.000.
Rye, Grover W., 4,192,694, Cl. 148-6.110.
Scriver, Richard M., Jr.; and Ross, Waldemar A., 4,192,366, Cl. 152-209.00R.

Gorman, Edward D. Flow distributor for leaching fields. 4,192,628, Cl. 405-45.000.

Goschke, Richard: *See—*
Ferrini, Pier G.; Goschke, Richard; Sallmann, Alfred; and Rossi, Alberto, 4,192,873, Cl. 424-246.000.

Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Copying apparatus. 4,192,608, Cl. 355-51.000.

Gospodar, Reinhard; and Heidemeyer, Paulus, to Volkswagenwerk Aktiengesellschaft. Apparatus for controlling the closing limit of a carburetor throttle valve. 4,192,202, Cl. 74-859.000.

Gould Inc.: *See—*
Bowers, John J., 4,193,122, Cl. 364-900.000.
Parkinson, David B.; and Parkinson, Truman D., 4,192,049, Cl. 29-2.000.

Goyne, Thomas E.: *See—*
Lobdell, Donn D.; Herman, Stephen J.; Anderson, Robert L.; and Goyne, Thomas E., 4,193,004, Cl. 250-577.000.

Graafmann, Jurgen, to Wavin B.V. Pipe with an external sealing body. 4,193,105, Cl. 361-215.000.

Grahac, Mirko, to WOMA-Apparatebau Wolfgang Maasberg & Co., GmbH. Full-flow relief valve. 4,192,343, Cl. 137-474.000.

Grandadam, Jean A.; Jobard, Alain; and Scheid, Jean-Pierre, to Roussel Uclaf. Novel zootechnical compositions. 4,192,870, Cl. 424-240.000.

Grandori, Carlo, to Robbins Company, The. Tunnel boring machines. 4,192,556, Cl. 299-56.000.

Graser, Reinhold; Lendle, Wilhelm; and Post, Hendrik W., to Hoechst Aktiengesellschaft. Purification of crude monochloromethane gas. 4,192,821, Cl. 260-652.00P.

Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., to Standard Oil Company, The. Catalysts and process for the ammoxidation of olefins. 4,192,776, Cl. 252-432.000.

Gray, Gary D., to Bralorne Resources Limited. Floating cushion sub. 4,192,155, Cl. 64-23.000.

Gray, Stan. Combustion mixture mixing device. 4,192,273, Cl. 123-141.000.

Green, Harold A.: *See—*
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,192,817, Cl. 260-513.00N.

Greenberg, Harry; and Auerbach, Richard, to Avnet, Inc. Directional antenna system with end loaded crossed dipoles. 4,193,077, Cl. 343-747.000.

Greten, Berndt, to Bison-Werke Bahre and Greten GmbH and Co. KG. Bottom-belt bunker for receiving and delivering particles serving for the manufacture of fiberboards, chipboards, or the like. 4,192,417, Cl. 198-601.000.

Griffiths, Alan J., to Fisons Limited. Methods for treating disease conditions. 4,192,860, Cl. 424-43.000.

Gross, Heiko, to Siempelkamp Giesserei KG. Cover for a nuclear reactor pressure vessel. 4,192,717, Cl. 176-87.000.

Grosskopf, Jack C.: *See—*
Stineman, Thomas L.; Edwards, Jeffrey D.; and Grosskopf, Jack C., 4,192,918, Cl. 435-256.000.

Grove Valve and Regulator Company: *See—*
Combes, Marvin G., 4,192,483, Cl. 251-172.000.

Groves, Kenneth L., Jr. Looped slide. 4,192,499, Cl. 272-56.50R.

Grudzinskas, Charles V.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,192,950, Cl. 562-500.000.

Grumbel, Eugen: *See—*
Bastgen, Wendel; Schreiber, Helmut; and Grumbel, Eugen, 4,192,743, Cl. 210-42.00R.

GTE Automatic Electric Laboratories Incorporated: *See—*
Baum, Henry K., 4,192,965, Cl. 174-135.000.
Scott, James, 4,192,976, Cl. 179-90.00K.

Gulf Research and Development Company: *See—*
Giannetti, Joseph P.; and Swift, Harold E., 4,192,653, Cl. 44-51.000.

Gulli, Frank. Bumper construction for motor vehicles. 4,192,538, Cl. 293-134.000.

Gunn, Joann. Storage container for roll tissue paper. 4,192,561, Cl. 312-42.000.

Gutfleisch, Peter O.: *See—*
Meyer, Adolf; and Gutfleisch, Peter O., 4,192,690, Cl. 106-99.000.

Haarmann & Reimer: *See—*
Bauer, Kurt; Krempel, Alfred; Molleken, Reiner; Wedemeyer, Karlfried; and Fiege, Helmut, 4,192,959, Cl. 568-764.000.

Haberle, Fritz; and Kurth, Hermann W., to Daimler-Benz Aktiengesellschaft. Door guidance, especially for the tail door of a station wagon. 4,192,039, Cl. 16-86.00B.

Habu, Takeshi: *See—*
Nishina, Yoshio; Matsuo, Syunji; Nagatani, Toshio; Takahashi, Kazuo; and Habu, Takeshi, 4,192,682, Cl. 430-405.000.

Haegele, Gerd, to Sulzer Brothers Limited. Exhaust pipe and mounting therefor. 4,192,142, Cl. 60-322.000.

Haegele, Gerd, to Sulzer Brothers Limited. Exhaust pipe. 4,192,143, Cl. 60-322.000.

Haeusser, Harry C.: *See—*
Schuller, James T.; and Haeusser, Harry C., 4,192,436, Cl. 221-129.000.

Hage, Charles T., to Eastman Kodak Company. Apparatus for selectively copying documents from two different document feeders. 4,192,607, Cl. 355-50.000.

Hagedorn, Erwin C.: *See—*
Babcock, Clarence L.; Busdiecker, Robert A.; and Hagedorn, Erwin C., 4,192,688, Cl. 106-39.700.

Haigh, Curzon J.: *See—*
Pammenter, Robert V.; and Haigh, Curzon J., 4,192,852, Cl. 423-42.000.

Hajok, Dieter: *See—*
Roeder, Georg; Sachs, Helmut; and Hajok, Dieter, 4,192,488, Cl. 266-77.000.

Hakamada, Takeshi; Soma, Misao; and Kano, Ikushi, to Hitachi, Ltd. Insulator for covering electric conductors. 4,192,352, Cl. 138-149.000.

Hakamata, Yoshio: *See—*
Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, 4,192,594, Cl. 354-90.000.

Halcon Research & Development Corporation: *See—*
Johnson, Richard A., 4,192,814, Cl. 260-429.00R.

Hales, Richard H.: *See—*
Reese, Max G.; and Hales, Richard H., 4,192,858, Cl. 424-1.000.

Hall, George W. Device for holding a surveyor's instrument. 4,192,076, Cl. 33-296.000.

Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Use of certain spiropyran derivatives for augmenting, enhancing or modifying the organoleptic properties of perfumes and colognes. 4,192,782, Cl. 252-522.00R.

Hall, Nigel: *See—*
Price, Raymond; and Hall, Nigel, 4,192,800, Cl. 260-205.000.

Hallenius, Tore J.; and Sagefors, Karl I. System for the storage of radioactive material in rock. 4,192,629, Cl. 405-128.000.

Hallgreen, Knud J.: *See—*
Rasmussen, Hans C.; and Hallgreen, Knud J., 4,192,455, Cl. 237-8.00R.

Halliburton Company: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,192,378, Cl. 166-186.000.
Cox, Bruce M.; and Ho, Morris D., 4,192,184, Cl. 73-194.00B.

Hamada, Masa: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.

Hamanaka, Hiroyoshi, to Toho Chemical Industry Co., Ltd. Automotive brake fluid compositions including semipolar borates and heteroborates. 4,192,759, Cl. 252-78.100.

Hamano, Nobuo, to Tomy Kogyo Co., Inc. Toy carrier vehicle. 4,192,093, Cl. 46-204.000.

Hamilton, Jerry W., to Automatic Tool Company, Inc. Hand held crimping tool. 4,192,171, Cl. 72-416.000.

Hamma, Karlmann; and Ott, Anton, to Zahnradfabrik Friedrichshafen AG. Control system for hydrostatic transmission. 4,192,199, Cl. 74-687.000.

Hammar, Martin. Contour detecting and dimension measuring apparatus. 4,192,613, Cl. 356-386.000.

Hammer, Klaus-Dieter: *See—*
Gerigk, Gunter; Klendauer, Wolfgang; Pietruck, Horst; and Hammer, Klaus-Dieter, 4,192,904, Cl. 428-36.000.

Hand, Ronnie D.: *See—*
Schmandt, Gary M.; Chappelear, Robert N.; and Hand, Ronnie D., 4,192,663, Cl. 65-11.00R.

Hankinson, Lawrence V.: *See—*
Antoniuk, Andrew V.; Hankinson, Lawrence V.; Boulter, David M.; and McMillan, William R., 4,192,228, Cl. 100-37.000.

Hannonen, Eero: *See—*
Tapio, Olli; Veijonen, Lassi; and Hannonen, Eero, 4,192,711, Cl. 162-199.000.

Hansen, Craig N., to Hansen Engine Corporation. Fluid control unit. 4,192,348, Cl. 137-624.150.

Hansen Engine Corporation: *See—*
Hansen, Craig N., 4,192,348, Cl. 137-624.150.

Hanson, Harold W., Sr., to Par-Way Mfg Co. Stable clear liquid release agent and method for preparation. 4,192,898, Cl. 426-250.000.

Harada, Kiyoshi: *See—*
Sasaki, Yoshiyuki; and Harada, Kiyoshi, 4,192,041, Cl. 19-0.350.

Hardman, Harley F.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,192,776, Cl. 252-432.000.

Hardt, Dietrich: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Hardt, Dietrich, 4,192,940, Cl. 528-370.000.

Hardtmann, Goetz E., to Sandoz, Inc. 4-Hydroxy-3-nitro-quinoline-2(1H)-ones. 4,192,876, Cl. 424-258.000.

Hardwick, Charles W. Re-breathing apparatus. 4,192,301, Cl. 128-205.170.

Hardy, Robert A., Jr.: *See—*
Wright, William B., Jr.; and Hardy, Robert A., Jr., 4,192,803, Cl. 260-243.300.

Hardy, William B.: *See—*
Mosby, William L.; and Hardy, William B., 4,192,796, Cl. 260-45.85S.

Hargens, Alan R.; and Mubarak, Scott J., to University of California, Regents of. Wick catheter pressure sensing probe and method of use. 4,192,319, Cl. 128-748.000.

Harner, Kermit I.: *See—*
Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,193,005, Cl. 290-44.000.

Harnischfeger Corporation: *See—*
Shields, Charles H.; and Kane, Gary D., 4,192,456, Cl. 237-12.30R.

Harris, Richard L., to United States of America, Air Force. Attitude indicator comparator warning system. 4,193,059, Cl. 340-27.0AT.

Harrison, George R.: *See—*
Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., 4,193,112, Cl. 364-200.000.

Harryson, Gunnar B.: *See—*
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, 4,192,490, Cl. 266-225.000.

Hartmann, Horst, to Zyliss Zysset AG. Cutting device for the shredding of foodstuffs such as onions, vegetables and fruits. 4,192,470, Cl. 241-169.000.

Hartnett, Michael J., to Torrington Company, The. Bearing with bearing cage. 4,192,560, Cl. 308-187.000.

Harvey, Walter W.; and Makrides, Alkis C., to EIC Corporation. Process for removing hydrogen sulfide and ammonia from gaseous streams. 4,192,854, Cl. 423-220.000.

Hascoe, Norman, to Semi-Alloys, Inc. Hermetic sealing cover for a container for semiconductor devices. 4,192,433, Cl. 220-200.000.

Hasegawa, Keiji; and Tatara, Yoshikuni, to Ricoh Company, Ltd. Character display apparatus. 4,193,071, Cl. 340-723.000.

Hasegawa, Tadao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seal structure. 4,192,520, Cl. 277-235.00B.

Haselgrove, Bob; and Nichol, John D., to Detexomat Machinery Limited. Hosiery toe closers. 4,192,242, Cl. 112-262.200.

Hashimoto, Isao; Nakagawa, Hiroaki; and Nambu, Hirohiko, to Mitsui Petrochemical Industries Ltd. Method for recovering resorcinol. 4,192,958, Cl. 568-763.000.

Hashimoto, Noboru; Fukuda, Hideo; and Shibata, Setsuo, to JGC Corporation. Liquid-gas contactor and liquid-gas contact process. 4,192,833, Cl. 261-36.00R.

Hashimoto, Sadakatsu: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.

Hashimoto, Shintaro: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.

Hashimoto, Tsutomu; and Nakamura, Nobuhiro, to Mitsubishi Denki Kabushiki Kaisha. Information reading system. 4,192,452, Cl. 235-471.000.

Hashiride, Tadaaki: *See—*
Hida, Takashi; Mitsui, Tsutomu; Hashiride, Tadaaki; and Kuwana, Kazutaka, 4,192,157, Cl. 66-76.000.

Haslam, Lester H.; Woods, Jay; and Woods, Verle W. Seed treating suspension and method of seed treatment. 4,192,095, Cl. 47-58.000.

Haslanger, Martin F., to E. R. Squibb & Sons, Inc. Prostacyclin analogs and their use in inhibition of arachidonic acid-induced platelet aggregation and bronchoconstriction. 4,192,891, Cl. 424-305.000.

Hassler, Andreas. Tunnel oven for baking ceramic products. 4,192,645, Cl. 432-144.000.

Hatanaka, Takefumi. Document shredder. 4,192,467, Cl. 241-34.000.

Hattori, Hiroyuki: *See—*
Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 4,192,608, Cl. 355-51.000.

Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air flow amount adjusting system for an internal combustion engine. 4,192,268, Cl. 123-119.0EC.

Hauck, Frederic P.; Narayanan, Venkatachala L.; O'Connor, Jeremiah J.; and Pilote, Raymond R., to E. R. Squibb & Sons, Inc. Ruminant feeds containing trichloroethyl esters of essential amino acids. 4,192,889, Cl. 424-309.000.

Hausmann, Winfried, to Massey-Ferguson Services N.V. Loader vehicles. 4,192,523, Cl. 280-400.000.

Haverdink, Virgil D.; and Landry, Henry J., Jr., to Deere & Company. Material conveyor. 4,192,386, Cl. 171-58.000.

Hawes, Michael. Photographic display apparatus and method. 4,192,091, Cl. 40-615.000.

Hawkins, Gary, to Belcastro, Harry, Sr., a part interest. Closure operated burglar alarm. 4,193,067, Cl. 340-546.000.

Hayasaka, Itirow: *See—*
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, 4,192,793, Cl. 260-42.140.

Hayashi, Hideaki, to Tokyo Magnetic Printing Company Ltd. Device for reproducing the recorded content of a magnetic card. 4,193,099, Cl. 360-17.000.

Hayashi, Mithuhilo: *See—*
Kawano, Hitoshi; Ikemura, Kiyoshi; and Hayashi, Mithuhilo, 4,192,987, Cl. 219-137.0PS.

Hayashi, Motoshige; and Kobayashi, Toshiro, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Process for producing expanded article of thermoplastic resin. 4,192,839, Cl. 264-45.500.

Hayashi, Osamu: *See—*
Shibayama, Kyoichi; Okahashi, Kazuo; and Hayashi, Osamu, 4,192,786, Cl. 260-18.0EP.

Hayashi, Torahiko; Maeda, Takashi; and Morikawa, Michio, to Rheon Automatic Machinery Co., Ltd. Apparatus for stretching dough material. 4,192,636, Cl. 425-96.000.

Hayden, Owen; Sheward, George E.; Ormrod, Derek T.; Willby, Christopher R.; and Firth, George F., to United Kingdom Atomic Energy Authority. Heat exchangers. 4,192,374, Cl. 165-158.000.

Hayden, Rodney, to TRW Inc. Low current relay. 4,193,052, Cl. 335-128.000.

Hazard, Jean-Pierre: *See—*
Bernard, Jacques; Bebin, Jean; and Hazard, Jean-Pierre, 4,192,742, Cl. 210-17.000.

Hazen, Wayne C.: *See—*
Reynolds, James E.; Hazen, Wayne C.; and Goens, Duane N., 4,192,676, Cl. 75-72.000.

Hefelfinger, Richard: *See—*
Studebaker, Irving G.; and Hefelfinger, Richard, 4,192,553, Cl. 299-2.000.

Heffernan, William R.; Vega, Mary-Louise; and Rockwell, Edward T., Sr., to American Cyanamid Company. Personnel marker device. 4,193,109, Cl. 362-34.000.

Heide, Helmut: *See—*
Deibig, Heinrich; Heide, Helmut; Reiner, Roland; and Koster, Kari, 4,192,021, Cl. 3-1.900.

Heidemeyer, Paulus: *See—*
Gospodar, Reinhard; and Heidemeyer, Paulus, 4,192,202, Cl. 74-859.000.

Heimaster, John W., to Coaltex, Inc. Reflected light determination of geological strata. 4,192,550, Cl. 299-1.000.

Heimbigner, Gary L.: *See—*
Khan, Mahboob; Godejahn, Jr. Gordan C.; Heimbigner, Gary L.; and Aghishian, Noubar A., 4,192,059, Cl. 29-571.000.

Heinrich, Wilhelm, to Messerschmitt-Bolkow-Blohm GmbH. Method and device for stopping out interfering radiators in an optical missile-steering device. 4,192,475, Cl. 244-3.160.

Heinzelmann, Karl-Georg; and Klein, Sigismund, to Siemens Aktiengesellschaft. Film feeder. 4,192,495, Cl. 271-10.000.

Heirich, William C. Spring action panel interlock. 4,192,117, Cl. 52-478.000.

Heitze, Gerhard: *See—*
Munker, Erich; Klein, Alfred; and Heitze, Gerhard, 4,192,208, Cl. 83-438.000.

Helbig, Joachim, to Verlapharm von Ehrlich A.G. Sedative preparation for animals and method. 4,192,865, Cl. 424-153.000.

Helix Technology Corporation: *See—*
Johnson, Robert W., 4,192,661, Cl. 62-12.000.

Hell, Hans, to Anonima Castelli S.p.A. Modular elements for composing disassemblable walls, cabinets, writing-desks or other pieces of furniture. 4,192,106, Cl. 52-36.000.

Heller, Anton H., to Poweray Infrared Corp. Material heating apparatus. 4,192,288, Cl. 126-343.50A.

Helm, George D.: *See—*
Cerny, Frank J., Jr.; Helm, George D.; and Wesoloski, Ronald G., 4,193,036, Cl. 455-327.000.

Helms, Charles C.: *See—*
deMey, Charles F., II; and Helms, Charles C., 4,192,614, Cl. 356-410.000.

Henkelmann, Kurt; and Bruckner, Dietrich, to Ernst Leitz Wetzlar GmbH. Slide projector with automatic focusing system. 4,192,585, Cl. 353-101.000.

Henriquez, Theodore A.: *See—*
Young, A. Mark; Henriquez, Theodore A.; and Tims, Allan C., 4,193,130, Cl. 367-149.000.

Henry, Brian, to Goodyear Tire & Rubber Company, The. Variable flex hose. 4,192,351, Cl. 138-126.000.

Henry, Raymond; Resneau, Jean-Claude; and Bouvet, Jean-Victor, to Thomson-CSF. Sealed enclosing system for coupling an optoelectronic device and an optical fibre. 4,192,574, Cl. 350-96.170.

Henton, Paul V.; and Fait, Roger J., to Emerson Electric Co. Bi-directional filter drier. 4,192,751, Cl. 210-136.000.

Herman, Stephen J.: *See—*
Lobdell, Donn D.; Herman, Stephen J.; Anderson, Robert L.; and Goyne, Thomas E., 4,193,004, Cl. 250-577.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Spielhoff, Horst, 4,192,617, Cl. 366-83.000.

Hermann C. Starck Berlin: *See—*
Krismer, Bruno; and Pungs, Harmut, 4,192,674, Cl. 75-10.00R.

Herring, James M., Jr.; and Russell-French, Harry M., to Budd Company, The. Railway car drive system. 4,192,238, Cl. 105-133.000.

Herrmann, Heinz, to Hoechst Aktiengesellschaft. Process for removing layers of selenium. 4,192,692, Cl. 134-2.000.

Herzner, Frederick C., to General Electric Company. Counterweighted blade damper. 4,192,633, Cl. 416-221.000.

Hesskamp, Richard R.: *See—*
Rassieur, Charles L.; and Hesskamp, Richard R., 4,192,485, Cl. 254-187.500.

Hetherington, Michael W.: *See—*
Barradas, George; and Hetherington, Michael W., 4,192,328, Cl. 132-37.00R.

Hewitt, William, to Koppers Company, Inc. Rotary union. 4,192,559, Cl. 308-36.100.

Hewlett-Packard Company: *See—*
Kronick, Melvyn N.; Bryson, Charles E., III; Bridgham, John A.; and Eletr, Sam H., 4,192,996, Cl. 250-373.000.

Heymann, Friedhelm. Apparatus for processing the surface of bodies having irregular contours. 4,192,036, Cl. 15-53.0AB.

Hida, Takashi; Mitsui, Tsutomu; Hashiride, Tadaaki; and Kuwana, Kazutaka, to Aisin Seiki Co., Ltd. Knitting width indication system for knitting machines. 4,192,157, Cl. 66-76.000.

Higginson, John F.: *See—*
Hirsch, Horst E.; Higginson, John F.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,192,851, Cl. 423-28.000.

Hignight, Charles G.: *See—*
Womack, D. Gene; and Hignight, Charles G., 4,192,393, Cl. 175-103.000.

Higuchi, Kazuo; and Matsumoto, Katsuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Seat-back frame for an automotive vehicle. 4,192,545, Cl. 297-216.000.

Hilbert, Francis H.; and Parker, Norman W., to Motorola, Inc. Receiver for compatible AM stereo signals. 4,192,968, Cl. 179-1.0GS.

Hill, John A.: *See—*
Chen, James L.; Cilento, Rudolfo D.; Hill, John A.; and La Via, Anthony L., 4,192,785, Cl. 260-17.4GC.

Hill, Max L., to Coleman Company, Inc., The. Air conditioner mounting assembly for a camping trailer. 4,192,542, Cl. 296-173.000.

Hill, Robert S.: *See—*
Williams, Ronald S.; and Hill, Robert S., 4,192,531, Cl. 285-222.000.

Hillion, Gerard; and Lassau, Christian, to Institut Francais du Petrole. Process for manufacturing dicyclohexanol propane by hydrogenation of diphenol propane. 4,192,960, Cl. 568-816.000.

Hilmer, Milton, to Sarco Company, Inc. Drain trap valve mechanism. 4,192,341, Cl. 137-445.000.

Hilti Aktiengesellschaft: *See—*
Kastreuz, Gerhard; and Waschk, Volker, 4,192,391, Cl. 173-116.000.

Hilzinger, Fritz; and Schwarz, Theodor, to Aesculap-Werke Aktiengesellschaft vormals Jetter & Scheerer. Clip for surgical purposes. 4,192,315, Cl. 128-346.000.

Himy, Albert; and Wagner, Otto C., to United States of America, Navy. Mass-transport separator for alkaline nickel-zinc cells and cell. 4,192,908, Cl. 429-53.000.

Hinsperger, Cornelius A. Cover for swimming pool. 4,192,025, Cl. 4-172.140.

Hintsch, Otto, to Sulzer Brothers Limited. Cloth take-up system. 4,192,353, Cl. 139-307.000.

Hirsch, Horst E.; Higginson, John F.; Parker, Ernest G.; and Swinkels, Godefridus M., to Sherritt Gordon Mines Limited. Leaching of metal sulphides. 4,192,851, Cl. 423-28.000.

Hitachi Construction Machinery Co., Ltd.: *See—*
Nakamura, Yozo; and Ohshina, Morio, 4,192,154, Cl. 64-21.000.

Hitachi, Ltd.: *See—*
Futamoto, Masaaki; Kawabe, Ushio; Hosoki, Shigeyuki; Komoda, Tsutomu; and Yamamoto, Shigehiko, 4,193,013, Cl. 313-341.000.
Hakamada, Takeshi; Soma, Misao; and Kano, Ikushi, 4,192,352, Cl. 138-149.000.
Kawaguchi, Ikuo, 4,193,086, Cl. 358-10.000.
Mizushima, Masashi, 4,193,095, Cl. 358-241.000.
Nakagawa, Sumio; Tanaka, Toshio; and Todo, Kenji, 4,192,641, Cl. 431-15.000.
Udagawa, Tsugio; Araya, Takeshi; and Yoshida, Takashi, 4,192,986, Cl. 219-137.00R.

Hitachi Seiko, Ltd.: *See—*
Udagawa, Tsugio; Araya, Takeshi; and Yoshida, Takashi, 4,192,986, Cl. 219-137.00R.

Hitt, James J.; and Mergner, George C., to Leeds & Northrup Company. Differential capacitance measuring circuit. 4,193,063, Cl. 340-200.000.

Ho, Morris D.: *See—*
Cox, Bruce M.; and Ho, Morris D., 4,192,184, Cl. 73-194.00B.

Hodge, Malcolm H., to TRW Inc. Guide-connector assembly for joining optical fibers and method of making guide therefor. 4,192,575, Cl. 350-96.210.

Hodges, Frank P.; Fowler, Harold W.; and Anderson, Phillip R., to Westinghouse Electric Corp. Laminar flow quiet torpedo nose. 4,192,246, Cl. 114-23.000.

Hoechst Aktiengesellschaft: *See—*
Gerigk, Gunter; Klendauer, Wolfgang; Pietruck, Horst; and Hammer, Klaus-Dieter, 4,192,904, Cl. 428-36.000.
Graser, Reinhold; Lendle, Wilhelm; and Post, Hendrik W., 4,192,821, Cl. 260-652.00P.
Herrmann, Heinz, 4,192,692, Cl. 134-2.000.
Lederer, Michael; and Bouman, Antonius J. M., 4,192,797, Cl. 525-243.000.
Mixich, Johann; and Jastrow, Horst, 4,192,922, Cl. 521-56.000.

Hoffmann-La Roche Inc.: *See—*
Berger, Leo; and Schmidt, Robert A., 4,192,809, Cl. 260-346.710.
Cohen, Noal, 4,192,816, Cl. 260-465.00D.

Hoffmann, Otto-Horst: *See—*
Aichert, Hans; Stark, Friedrich; Stephan, Herbert; and Hoffmann, Otto-Horst, 4,192,253, Cl. 118-712.000.

Hogan, Daniel J.: *See—*
Bennett, Derek J.; and Hogan, Daniel J., 4,193,057, Cl. 367-153.000.

Holbrook, Alan R.: *See—*
Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., 4,193,112, Cl. 364-200.000.

Hollstein, Elmer J.: *See—*
Stearns, Richard S.; and Hollstein, Elmer J., 4,192,731, Cl. 208-8.0LE.

Holston Manufacturing Company: *See—*
Lingenfelter, Ralph E., 4,192,019, Cl. 2-239.000.

Holt, Neil L., to Anamet Laboratories, Inc. Method and means for biaxially testing material. 4,192,194, Cl. 73-794.000.

Holtvoigt, Werner: *See—*
Beck, Heinz; Frassek, Karl H.; Holtvoigt, Werner; and Mukerjee, Ambar, 4,192,930, Cl. 525-227.000.

Holubka, Joseph W.: *See—*
Dickie, Ray A.; Holubka, Joseph W.; and Chattha, Mohinder S., 4,192,932, Cl. 525-511.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Higuchi, Kazuo; and Matsumoto, Katsuhiko, 4,192,545, Cl. 297-216.000.
Ishihara, Takeo; and Miura, Seishi, 4,192,276, Cl. 123-179.00K.
Nakagawa, Takashi; Sugiuchi, Tadashi; Iwashita, Kanau; and Uchida, Masaaki, 4,192,402, Cl. 181-256.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, 4,192,403, Cl. 181-268.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, 4,192,404, Cl. 181-272.000.

Honda, Michiyasu: *See—*
Ueda, Yuziro; Yoshida, Toru; and Honda, Michiyasu, 4,192,486, Cl. 266-44.000.

Honda Motor Co., Ltd.: *See—*
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.

Honeywell Inc.: *See—*
Bagley, James S.; and Van Norden, Gary J., 4,193,100, Cl. 360-73.000.
Downs, Byron E., II, 4,193,028, Cl. 324-237.000.
Esposito, Ralph H., 4,193,078, Cl. 346-76.00R.
Kabat, John L.; and Kompelien, Arlon D., 4,193,006, Cl. 307-117.000.

Honeywell Information Systems Inc.: *See—*
Tippetts, K. Boyd, 4,192,449, Cl. 234-111.000.

Hood, Maxwell G., to Fowlerex Pty. Limited. Reclamation of cement slurry. 4,192,745, Cl. 210-66.000.

Hooker Chemicals & Plastics Corp.: *See—*
Witschard, Gilbert, 4,192,828, Cl. 525-83.000.

Hopstock, David M.: *See—*
Colombo, Arthur F.; and Hopstock, David M., 4,192,738, Cl. 209-5.000.

Horiike, Yasuhiro, to Tokyo Shibaura Electric Co., Ltd. Gas-etching device. 4,192,706, Cl. 156-643.000.

Horike, Akihiro; Itakura, Yoshio; and Shingu, Tadashi, to Teijin Limited. Photocurable unsaturated polyester resin composition and cross-linking agents. 4,192,685, Cl. 430-283.000.

Horman, Frederick H.: *See—*
Deaton, Ion V.; and Horman, Frederick H., 4,192,082, Cl. 35-10.400.

Horne, William P., to Gas-Fired Products, Inc. Apparatus and method for automatically controlling curing conditions in a tobacco curing barn. 4,192,323, Cl. 131-135.000.

Hornsey, Derek: *See—*
Savard, Guy; Lee, Robert G. H.; and Hornsey, Derek, 4,192,740, Cl. 210-3.000.

Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., to Exxon Research & Engineering Co. Method of making lead-rich and bismuth-rich pyrochlore compounds using an alkaline medium and a reaction enhancing anodic potential. 4,192,780, Cl. 252-518.000.

Horton, Richard H., to United States of America, Energy. Solar receiver heliostat reflector having a linear drive and position information system. 4,192,583, Cl. 353-3.000.

Hosokawa, Minoru; Ishii, Hiroshi; Kawamura, Yoshikazu; and Okazaki, Sakiho, to Kabushiki Kaisha Suwa Seikosha. Step motor control mechanism for electronic timepiece. 4,192,131, Cl. 368-157.000.

Hosoki, Shigeyuki: *See—*
Futamoto, Masaaki; Kawabe, Ushio; Hosoki, Shigeyuki; Komoda, Tsutomu; and Yamamoto, Shigehiko, 4,193,013, Cl. 313-341.000.

Hou, Joseph P.: *See—*
Mackaness, George B.; and Hou, Joseph P., 4,192,859, Cl. 424-5.000.

Houghton, LeRoy H.: *See—*
Podiak, Richard S.; Houghton, LeRoy H.; and Rempes, Paul E., Jr., 4,193,012, Cl. 313-137.000.

Houkawa, Kouji; Yamauchi, Yoshiki; and Yoshikawa, Shokichiro, to Nippon Telegraph and Telephone Public Corporation. Temperature compensated surface acoustic wave oscillators. 4,193,045, Cl. 331-107.00A.

Hoult, David I.; and Styles, Peter, to National Research Development Corporation. Pulsed nuclear magnetic resonance spectrometers. 4,193,024, Cl. 324-313.000.

Hruza, Denis E., Sr.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,192,782, Cl. 252-522.00R.

Huebner, Bernhard; and Tresser, Dietfried, to Laeis-Werke Aktiengesellschaft. Process and apparatus for upsetting pipe ends. 4,192,167, Cl. 72-356.000.

Hughes, Nathaniel. Vortex generating device with external flow interrupting body. 4,192,465, Cl. 239-405.000.

Huiatt, Jerry L.: *See—*
Thompson, Philip; Huiatt, Jerry L.; and Seidel, Don C., 4,192,737, Cl. 209-5.000.

Hultman, Bengt G.: *See—*
Bergstrom, John R.; Hultman, Bengt G.; and Dalborg, Astrid T. P., 4,192,708, Cl. 162-49.000.

Hunke, Friedrich; and Philipp, Heinz, to Automatik Apparate-Maschinenbau H. Hench GmbH. Apparatus for cooling and granulating thermoplastic strands. 4,192,635, Cl. 425-71.000.

Hunt, Norman, to Associated Engineering Limited. Actuator mechanism incorporating screw-and-nut devices. 4,192,398, Cl. 180-178.000.

Hunter Douglas International N.V.: *See—*
Taylor, Ian D., 4,192,369, Cl. 160-223.000.

Huntington Alloys, Inc.: *See—*
Crickard, James L.; and Sheets, Harold L., 4,192,177, Cl. 73-49.500.

Huson, Loyal A.: *See—*
Kridler, Edward L.; Eisenhauer, Marvin W.; and Huson, Loyal A., 4,192,283, Cl. 126-25.0AA.

Hyakumura, Kazushi, to Olympus Optical Company Limited. Behind-stop type lens system for photographic cameras. 4,192,579, Cl. 350-227.000.

Hyden, Viktor H. Dialysis apparatus with selective chemical activity. 4,192,748, Cl. 210-87.000.

Hydril Company: *See—*
Blose, Thomas L., 4,192,533, Cl. 285-334.000.

Hymans, Nelson J. Tensioning apparatus and method of applying tension to a tendon. 4,192,215, Cl. 85-36.000.

Hyuga Smelting Co., Ltd.: *See—*
Baba, Kohzo; and Nagatomo, Itsuyoshi, 4,192,673, Cl. 75-0.50C.

Ical, Incorporated: *See—*
Munnerlyn, Charles R.; and Clapham, Terrance N., 4,192,317, Cl. 128-646.000.

Iida, Noboru: *See—*
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, 4,192,793, Cl. 260-42.140.

Iizuka, Haruhiko; Sugasawa, Fukashi; Matsumoto, Junichiro; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Internal combustion engine for motor vehicle. 4,192,278, Cl. 123-198.00F.

Iizumi, Tomomitsu, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Control valve. 4,192,346, Cl. 137-599.000.

Ikemura, Kiyoshi: *See—*
Kawano, Hitoshi; Ikemura, Kiyoshi; and Hayashi, Mithuhilo, 4,192,987, Cl. 219-137.0PS.

Illinois Tool Works Inc.: *See—*
Platt, John R.; and Weaver, William N., 4,192,096, Cl. 47-73.000.

Imam, Imdad: *See—*
Barkan, Philip; and Imam, Imdad, 4,192,981, Cl. 200-144.00B.

Imamura, Akio: *See—*
Yamaga, Eiichi; Aoki, Eiichiro; and Imamura, Akio, 4,192,212, Cl. 84-1.030.

Imamura, Makoto, to Tokyo Shibaura Electric Co., Ltd. Apparatus for removing jitter in color television signal. 4,193,085, Cl. 358-8.000.

Immink, Kornelis A.: *See—*
Kleuters, Wilhelm J.; Van Rosmalen, Gerard E.; Bierhoff, Martinus P. M.; and Immink, Kornelis A., 4,193,091, Cl. 358-128.500.

Imperial Chemical Industries Limited: *See—*
Price, Raymond; and Hall, Nigel, 4,192,800, Cl. 260-205.000.

Inahara, Motoharu: *See—*
Morigami, Eiji; and Inahara, Motoharu, 4,192,971, Cl. 179-6.00E.

Industrie Pirelli S.p.A.: *See—*
Maiocchi, Luigi, 4,192,368, Cl. 152-362.00R.

Ingersoll-Rand Company: *See—*
Krasnoff, Eugene L.; and Lindeboom, Herman, 4,192,219, Cl. 91-276.000.

Inoue, Yoshiaki: *See—*
Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,192,773, Cl. 252-429.00R.

Inoue, Yukihiro: *See—*
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.

Institut Francais du Petrole: *See—*
Hillion, Gerard; and Lassau, Christian, 4,192,960, Cl. 568-816.000.

International Business Machines Corporation: *See—*
Beuch, Wallace E.; O'Konski, George J.; Rusch, Kenneth D.; and Wytaski, Thomas A., 4,193,102, Cl. 360-105.000.
Carlson, John A.; Rusch, Kenneth D.; and Sippel, David L., 4,193,101, Cl. 360-97.000.
Dougherty, William E., 4,193,082, Cl. 357-80.000.
Gersbach, John E., 4,193,127, Cl. 365-174.000.
Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., 4,193,131, Cl. 375-2.000.

International Flavors & Fragrances Inc.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,192,782, Cl. 252-522.00R.

International Standard Electric Corporation: *See—*
Mucci, Peter E. R., 4,192,569, Cl. 339-96.000.
Vance, Ian A. W., 4,193,034, Cl. 375-88.000.

International Tapetronics Corporation: *See—*
Fesler, John C.; and Bell, Dennis M., 4,193,103, Cl. 360-122.000.

International Telephone and Telegraph Corporation: *See—*
Rabow, Gerald; and Nashman, Alvin E., 4,193,030, Cl. 375-2.000.

Inui, Taiji: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.

Inukai, Mitsuo; Iwatsuki, Masahiro; and Tamura, Keiichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Webbing retractor for seatbelt system. 4,192,474, Cl. 242-107.40A.

Iolab Corporation: *See—*
LaHaye, Peter G., 4,192,022, Cl. 3-13.000.

Irick, Gether, Jr.: *See—*
Wang, Richard H. S.; Irick, Gether, Jr.; and Ownby, James C., 4,192,794, Cl. 260-42.450.

Irpola, Eero A. Method of obtaining an even moisture profile in a cylinder drier and a means for carrying out the method. 4,192,080, Cl. 34-41.000.

Isdale, Charles E., Sr.: *See*—
Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., 4,192,916, Cl. 435-274.000.

Ishidera, Takashi; and Enjoji, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air cleaner including noise-limiting cool air intake nose. 4,192,660, Cl. 55-276.000.

Ishiguro, Yasuo: *See*—
Wakazono, Kenji; Ishiguro, Yasuo; and Saito, Toshihisa, 4,192,595, Cl. 354-133.000.

Ishihara, Masao: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.

Ishihara, Takeo; and Miura, Seishi, to Honda Giken Kogyo Kabushiki Kaisha. Safety arrangement in kickstart apparatus for an internal combustion engine. 4,192,276, Cl. 123-179.00K.

Ishihara, Taketoshi: *See*—
Aoki, Mitsugu; Konishi, Yoshikazu; and Ishihara, Taketoshi, 4,192,582, Cl. 351-30.000.

Ishii, Hiroshi: *See*—
Hosokawa, Minoru; Ishii, Hiroshi; Kawamura, Yoshikazu; and Okazaki, Sakiho, 4,192,131, Cl. 368-157.000.

Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.

Ishkhanov, Evgeny S.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

Itakura, Yoshio: *See*—
Horike, Akihiro; Itakura, Yoshio; and Shingu, Tadashi, 4,192,685, Cl. 430-283.000.

Ito, Keizo: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.

Ito, Ryosuke; and Takahashi, Susumu, to Sansui Electric Co. Ltd. Coupling an outer antenna with a radio receiver having a bar antenna. 4,193,076, Cl. 343-702.000.

Ito, Yoshiaki: *See*—
Kato, Hiroshi; Ito, Yoshiaki; Tokonami, Hiroshi; and Sawada, Atsuo, 4,192,649, Cl. 8-138.000.

Iwahara, Makoto. Stage-expanded stereophonic sound reproduction. 4,192,969, Cl. 179-1.00G.

Iwasa, Masakazu: *See*—
Kato, Hisashi; Iwasa, Masakazu; and Kudo, Yoshio, 4,192,232, Cl. 101-426.000.

Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Morigami, Eiji; and Inahara, Motoharu, 4,192,971, Cl. 179-6.00E.

Iwashita, Kanau: *See*—
Nakagawa, Takashi; Sugiuchi, Tadashi; Iwashita, Kanau; and Uchida, Masaaki, 4,192,402, Cl. 181-256.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, 4,192,403, Cl. 181-268.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, 4,192,404, Cl. 181-272.000.

Iwatsuki, Masahiro: *See*—
Inukai, Mitsuo; Iwatsuki, Masahiro; and Tamura, Keiichi, 4,192,474, Cl. 242-107.40A.

J. Schwartzman Manufacturing & Supply Co.: *See*—
Schwartzman, Irwin J., 4,192,217, Cl. 85-41.000.

Jackson, Hiram S.: *See*—
Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., 4,193,053, Cl. 337-275.000.

Jackson, Philip, to E. Beaudry & Cie, Societe Anonyme. Screens for water intakes. 4,192,749, Cl. 210-107.000.

Jacobsen, Robert T.: *See*—
Maher, John P.; and Jacobsen, Robert T., 4,192,698, Cl. 156-89.000.

Jacomini, Omar J., to United States of America, Air Force. Radiant-energy controlled proximity fuze. 4,192,235, Cl. 102-214.000.

Jager, Heinz. Spring roll mill. 4,192,469, Cl. 241-121.000.

Jagst, Peter, to Trutzschler GmbH & Co. KG. Apparatus for breaking textile fiber bales. 4,192,042, Cl. 19-81.000.

Jahn, Gerhard. Loose leaf binder. 4,192,620, Cl. 402-15.000.

Jahnke, Richard W., to Lubrizol Corporation, The. Rust inhibitor additive compositions, method of making, and aqueous fluids containing the same. 4,192,769, Cl. 252-389.00R.

Jalan, Vinod M.; Landsman, Douglas A.; and Lee, John M., to United Technologies Corporation. Electrochemical cell electrodes incorporating noble metal-base metal alloy catalysts. 4,192,907, Cl. 429-40.000.

James, George S. Solar water heaters. 4,192,287, Cl. 126-449.000.

James, Robert G.: *See*—
Kendig, Paul M.; Lawther, James M.; and James, Robert G., 4,192,245, Cl. 114-23.000.

Janakiev, Nikolai. Burst-protected steel pressure vessel with double protection in radial as well as axial direction. 4,192,718, Cl. 176-87.000.

Jankowski, Joseph, Jr., to Communications Satellite Corporation. Apparatus for controlling echo in communication systems utilizing a voice-activated switch. 4,192,979, Cl. 179-170.200.

Japan Oxygen Co., Ltd.: *See*—
Ogata, Shunji; and Yamamoto, Yohei, 4,192,662, Cl. 62-13.000.

Jastrow, Horst: *See*—
Mixich, Johann; and Jastrow, Horst, 4,192,922, Cl. 521-56.000.

Jenoptik Jena G.m.b.H.: *See*—
Marckwardt, Werner, 4,193,117, Cl. 364-728.000.

Jensen, Ronald N., to United States of America, National Aeronautics and Space Administration. Combined solar collector and energy storage system. 4,192,290, Cl. 126-437.000.

Jeromin, Lothar S., to Xerox Corporation. Blanket heated photoreceptor. 4,192,989, Cl. 219-216.000.

Jessup, Wilbur F., to Cincinnati Milacron Inc. Centerless plunge grinding machine with progressive angle development. 4,192,102, Cl. 51-103.00R.

JGC Corporation: *See*—
Hashimoto, Noboru; Fukuda, Hideo; and Shibata, Setsuo, 4,192,833, Cl. 261-36.00R.

Jobard, Alain: *See*—
Grandadam, Jean A.; Jobard, Alain; and Scheid, Jean-Pierre, 4,192,870, Cl. 424-240.000.

John Heathcoat & Company Limited: *See*—
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, 4,192,047, Cl. 28-220.000.

John Thomas Batts, Inc.: *See*—
Batts, John H., 4,192,441, Cl. 223-96.000.

Johnson, Bruce K.: *See*—
LaRocque, Arthur G.; Whiteside, George D.; and Johnson, Bruce K., 4,192,587, Cl. 354-27.000.

Johnson Controls Inc.: *See*—
Brzezinski, Donald E., 4,192,098, Cl. 49-91.000.

Johnson, Gary D. Holder for dental floss. 4,192,330, Cl. 132-91.000.

Johnson & Johnson: *See*—
Millet, Marcus J., 4,192,304, Cl. 128-214.400.

Johnson, Louis W. Cone crusher. 4,192,472, Cl. 241-215.000.

Johnson, Michael K. Self-propelling toy. 4,192,094, Cl. 46-207.000.

Johnson, Richard A., to Halcon Research & Development Corporation. Process for catalytic conversion of thallium (I) to thallium (III). 4,192,814, Cl. 260-429.00R.

Johnson, Robert M., to Reed and Barton Corporation. Decorated metal objects drawn from decorated blanks. 4,192,166, Cl. 72-347.000.

Johnson, Robert W., to Helix Technology Corporation. Adsorbing impurities from cryogenic fluid make-up prior to admixing with feed. 4,192,661, Cl. 62-12.000.

Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,192,808, Cl. 260-345.200.

Johnson, William L.: *See*—
Walters, Robert A.; Johnson, William L.; and Bivins, Gary W., 4,192,316, Cl. 128-419.0PG.

Jones Dairy Farm: *See*—
Jones, Edward C., Jr., 4,192,639, Cl. 425-372.000.

Jones, Edward C., Jr., to Jones Dairy Farm. Apparatus for straightening sausage links. 4,192,639, Cl. 425-372.000.

Jones, Horace T., to Baxter Travenol Laboratories, Inc. Reflectivity compensating apparatus. 4,192,611, Cl. 356-320.000.

Jordan, Lawrence J., to Maytag Company, The. Sidewall construction for silverware basket. 4,192,432, Cl. 220-83.000.

Joshi, Shridhar B., to Pittsburgh Corning Corporation. Method of making a cellular body from a high silica borosilicate composition. 4,192,664, Cl. 65-22.000.

Jouret, Edouard, to Crouzet. Two gear train reduction mechanism. 4,192,198, Cl. 74-384.000.

Jox, Rainer: *See*—
Bubik, Alfred; Jox, Rainer; and Schultz, Hans-Joachim, 4,192,710, Cl. 162-198.000.

Juby, Peter F., to Bristol-Myers Company. Optionally substituted 4-oxo-4H-pyrido[1,2-a]pyrimidine-3-N-(1H-tetrazol-4-yl)carboxamides and their use as antiallergy agents. 4,192,944, Cl. 544-282.000.

Jujo Paper Co., Ltd.: *See*—
Naito, Naoki, 4,192,446, Cl. 229-37.00R.

Junger, Rudolf; and Maulhardt, Hans-Joachim, to Akzona Incorporated. Cooling agent mixture containing ethylene glycol monoacetate, ethylene glycol diacetate, and glycol monomethyl ether for low-temperature freezing processes. 4,192,760, Cl. 252-79.000.

Jungwirth, Dieter; Renoth, Josef; and Wlodkowski, Johann, to Dyckerhoff & Widmann Aktiengesellschaft. Arrangement for interconnecting bundles of prestressing tendons for prestressed concrete. 4,192,114, Cl. 52-230.000.

Kabat, John L.; and Kompelien, Arlon D., to Honeywell Inc. Multistage controller. 4,193,006, Cl. 307-117.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Komaki, Shojiro, 4,192,133, Cl. 368-73.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ueda, Masao, 4,192,409, Cl. 192-4.00R.

Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho: *See*—
Nakao, Kozaburo; and Miyajima, Toru, 4,192,962, Cl. 13-7.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Hosokawa, Minoru; Ishii, Hiroshi; Kawamura, Yoshikazu; and Okazaki, Sakiho, 4,192,131, Cl. 368-157.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Inukai, Mitsuo; Iwatsuki, Masahiro; and Tamura, Keiichi, 4,192,474, Cl. 242-107.40A.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Tanasawa, Yasusi; Muto, Norio; and Saito, Akinori, 4,192,466, Cl. 239-464.000.

Kagaya, Hajime: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.

Kahn, Leonard R. Reduction of adjacent channel interference. 4,192,970, Cl. 179-1.0GS.

Kajinami, Shingo; Saunders, Elmer J.; and Schnell, Philip G., to Standard Oil Company (Indiana). Heat treatment for single-cell materials and resultant products. 4,192,897, Cl. 426-60.000.

Kakumae, Masaru: *See*—
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.

Kalasek, Karl, to Vereinigte Edelstahlwerke Aktiengesellschaft, Firma. Sterilization process and apparatus for infusion solutions and the like filled in containers. 4,192,845, Cl. 422-25.000.

Kambara, Ginjiro: *See*—
Koike, Susumu; Kambara, Ginjiro; and Matsuda, Toshio, 4,193,080, Cl. 357-23.000.

Kamitakahara, Atushi: *See*—
Fushiki, Isamu; Kamitakahara, Atushi; and Mori, Keiichi, 4,192,680, Cl. 430-380.000.

Kamiyama, Satoru: *See*—
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.

Kanbe, Masaru: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.

Kane, Gary D.: *See*—
Shields, Charles H.; and Kane, Gary D., 4,192,456, Cl. 237-12.30R.

Kanebo, Ltd.: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.

Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,192,681, Cl. 430-373.000.

Kano, Ikushi: *See*—
Hakamada, Takeshi; Soma, Misao; and Kano, Ikushi, 4,192,352, Cl. 138-149.000.

Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., to Kewanee Industries, Inc. Amphoteric surfactants. 4,192,817, Cl. 260-513.00N.

Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. Means for effecting cooling within elements for a solar cell array. 4,193,081, Cl. 357-30.000.

Karas, Anthony J. Tennis serving cage. 4,192,503, Cl. 273-29.00A.

Karayianis, Nick: *See*—
Morrison, Clyde A.; Karayianis, Nick; and Wortman, Donald E., 4,193,044, Cl. 331-94.50F.

Karikawa, Tohru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Film feed mechanism for a spaced apart take-up shaft and film take-up spool. 4,192,600, Cl. 354-212.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Kohl, Karl, 4,192,158, Cl. 66-146.000.
Kohl, Karl, 4,192,159, Cl. 66-203.000.

Karpman, Yakov S.: *See*—
Sheludyakov, Viktor D.; Kirilin, Alexei D.; Mironov, Vladimir F.; Glushakov, Sergei N.; and Karpman, Yakov S., 4,192,815, Cl. 260-453.00P.

Kashio, Toshio, to Casio Computer Co., Ltd. Key input apparatus. 4,193,038, Cl. 328-104.000.

Kastner, Sidney O., to United States of America, National Aeronautics and Space Administration. Diffractoid grating configuration for X-ray and ultraviolet focusing. 4,192,994, Cl. 250-280.000.

Kastreuz, Gerhard; and Waschk, Volker, to Hilti Aktiengesellschaft. Piston for a hammer drill having a separable part. 4,192,391, Cl. 173-116.000.

Kato, Haruhiro: *See*—
Yaguchi, Masachika; and Kato, Haruhiro, 4,192,581, Cl. 350-357.000.

Kato, Hiroshi; Ito, Yoshiaki; Tokonami, Hiroshi; and Sawada, Atsuo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process of sizing, weaving, desizing and waste water treatment. 4,192,649, Cl. 8-138.000.

Kato, Hisashi; Iwasa, Masakazu; and Kudo, Yoshio, to Fuji Photo Film Co., Ltd. Electrostatic image recording method and apparatus therefor. 4,192,232, Cl. 101-426.000.

Kato, Yuzo: *See*—
Kurahayashi, Sadasuke; Kato, Yuzo; Tsuda, Shin; Muto, Hakaru; and Watanabe, Asao, 4,193,097, Cl. 358-261.000.

Katzen, Stanley J.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,192,775, Cl. 252-430.000.

Kawabe, Ushio: *See*—
Futamoto, Masaaki; Kawabe, Ushio; Hosoki, Shigeyuki; Komoda, Tsutomu; and Yamamoto, Shigehiko, 4,193,013, Cl. 313-341.000.

Kawaguchi, Ikuo, to Hitachi, Ltd. Convergence detecting device for color picture tube. 4,193,086, Cl. 358-10.000.

Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph, 4,192,210, Cl. 84-1.010.

Kawakami, Yoshito, to Toppan Printing Co., Ltd.; and Nikka Kabushiki Kaisha. Washing apparatus for ink rollers of printing machine. 4,192,231, Cl. 101-425.000.

Kawamura, Yoshikazu: *See*—
Hosokawa, Minoru; Ishii, Hiroshi; Kawamura, Yoshikazu; and Okazaki, Sakiho, 4,192,131, Cl. 368-157.000.

Kawano, Hitoshi; Ikemura, Kiyoshi; and Hayashi, Mithuhilo. High frequency arc welding method and apparatus. 4,192,987, Cl. 219-137.0PS.

Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,192,681, Cl. 430-373.000.

Kazino, Sadayosi; and Doi, Tatsuo, to Nippondenso Co., Ltd. Starter with a shock absorbing arrangement. 4,192,195, Cl. 74-7.00A.

Kazuhiro, Suzuoki: *See*—
Gensho, Takahashi; Masamitsu, Yanai; Masakazu, Kurihara; Yoneharu, Tanaka; and Kazuhiro, Suzuoki, 4,192,684, Cl. 430-284.000.

Keilholz, Friedrich, to Ludwig Peithmann KG. Flowmeter for liquids. 4,192,185, Cl. 73-243.000.

Keith, Charles H.; and Tucker, Richard O., to Celanese Corporation. Process for producing filter material. 4,192,838, Cl. 264-10.000.

Keller Corporation, The: *See*—
Keller, Leonard J., 4,192,651, Cl. 44-1.0SR.

Keller, Leonard J., to Keller Corporation, The. Method of producing pulverulent carbonaceous fuel. 4,192,651, Cl. 44-1.0SR.

Kelley, John S.; and Moldas, Richard P., to USM Corporation. Method of making can closures. 4,192,244, Cl. 113-121.00C.

Kelly, Thomas L. Taped and double glued rubber joint. 4,192,116, Cl. 52-469.000.

Kelsey-Hayes Company: *See*—
Bertolasi, Robert B., 4,193,022, Cl. 318-592.000.

Kemi Oy: *See*—
Saalasti, Tapio, 4,192,088, Cl. 37-3.000.

Kendig, Paul M.; Lawther, James M.; and James, Robert G., to United States of America, Navy. Guiding means for self-propelled torpedoes. 4,192,245, Cl. 114-23.000.

Kennedy, Alvin B., Jr. Blowout preventer and method of insuring prevention of fluid leaks out of a wellhead. 4,192,379, Cl. 166-250.000.

Kennedy, Andrew J., to United States of America, Army. High strength extended leakage path ceramic tube wall for image intensifier and method of manufacture. 4,192,064, Cl. 29-631.000.

Kennedy, Russell J.; Lazier, Samuel S.; and Zorzi, Joe. Float controlled volumetric gauge. 4,192,187, Cl. 73-321.000.

Kenrich Petrochemicals, Inc.: *See*—
Sugerman, Gerald; and Monte, Salvatore J., 4,192,792, Cl. 260-42.140.

Kepco, Inc.: *See*—
Nercessian, Sarkis, 4,193,104, Cl. 361-56.000.

Kewanee Industries, Inc.: *See*—
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,192,817, Cl. 260-513.00N.

Khan, Mahboob; Godejahn, Jr. Gordan C.; Heimbigner, Gary L.; and Aghishian, Noubar A., to Rockwell International Corporation. Process for and structure of high density VLSI circuits, having inherently self-aligned gates and contacts for FET devices and conducting lines. 4,192,059, Cl. 29-571.000.

Kiang, Yen-Hsiung, to Trane Company, The. Method for hot gas cooling and gaseous contaminant removal. 4,192,659, Cl. 55-89.000.

Kiehs, Karl; and Theobald, Hans, to BASF Aktiengesellschaft. Manufacture of salts of O,S-dithiophosphoric acids. 4,192,831, Cl. 260-987.000.

Kieser, Hermann: *See*—
Schnizler, Albrecht, Jr.; and Kieser, Hermann, 4,192,982, Cl. 200-157.000.

Kiko, Frederick J., to Lorain Products Corporation. Multi-section apparatus for improving signal transmission through telephone transmission lines. 4,192,974, Cl. 179-16.00F.

Kikuchi, Kenichi: *See*—
Shiratori, Harunori; and Kikuchi, Kenichi, 4,192,529, Cl. 280-689.000.

Kikuchi, Takeshi: *See*—
Tanaka, Shigenori; Tojo, Akio; Ohnishi, Kimimasa; and Kikuchi, Takeshi, 4,192,357, Cl. 139-450.000.

Kikuchi, Uhee: *See*—
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.

Killian, Henry R. Direct digital control device. 4,193,019, Cl. 318-13.000.

Kimball, David V., to Kimball Industries, Inc. Unidirectional bearing structure having temperature cycling tolerance. 4,192,190, Cl. 73-665.000.

Kimball Industries, Inc.: *See*—
Kimball, David V., 4,192,190, Cl. 73-665.000.

Kimura, Hironobu: *See*—
Shirayama, Shimpey; Konagai, Chikara; Terasawa, Michitaka; and Kimura, Hironobu, 4,193,000, Cl. 250-385.000.

Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., to General Electric Company. Method for casting ultrathin methylpentene polymer membranes. 4,192,842, Cl. 264-298.000.

Kimura, Suguru: *See*—
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.

King, Fred V. Crossbow with trigger locking device. 4,192,281, Cl. 124-25.000.
Kinsekisha Laboratory, Ltd.: *See*—
Chiba, Tadataka, 4,193,046, Cl. 331-109.000.
Kipchakbaev, Alexandr D.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.
Kirilin, Alexei D.: *See*—
Sheludyakov, Viktor D.; Kirilin, Alexei D.; Mironov, Vladimir F.; Glushakov, Sergei N.; and Karpman, Yakov S., 4,192,815, Cl. 260-453.00P.
Kirkland, Kerry G.; and Masciopinto, Anthony J., to Armco Inc. Offshore multiple well drilling and production apparatus. 4,192,383, Cl. 166-341.000.
Kitagawa, Katsutoshi; and Yamauchi, Hiroki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Valve drive device for an internal combustion engine. 4,192,263, Cl. 123-90.390.
Kitahara, Kenichi: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.
Kitaura, Mashio, to Minolta Camera Kabushiki Kaisha. Indicating system for cameras. 4,192,590, Cl. 354-53.000.
Kitz, Richard J.: *See*—
Savarese, John J.; Kitz, Richard J.; and Ginsburg, Sara, 4,192,877, Cl. 424-258.000.
Klar, Erhard: *See*—
Moskowitz, Larry N.; and Klar, Erhard, 4,192,672, Cl. 75-0.50C.
Klein, Alfred: *See*—
Munker, Erich; Klein, Alfred; and Heitze, Gerhard, 4,192,208, Cl. 83-438.000.
Klein, Bernard J.; and Verga, Samuel D. Apparatus for cleaning and/or coating. 4,192,038, Cl. 15-250.060.
Klein, Carlton: *See*—
Lemchen, Marc S.; Chong, Ian M.; and Klein, Carlton, 4,192,070, Cl. 433-11.000.
Klein, Lloyd E.: *See*—
Koontz, Ralph F.; and Klein, Lloyd E., 4,192,913, Cl. 429-119.000.
Klein, Sigismund: *See*—
Heinzelmann, Karl-Georg; and Klein, Sigismund, 4,192,495, Cl. 271-10.000.
Klema, Kenneth G. Sliding door apparatus. 4,192,100, Cl. 49-404.000.
Klemm, Richard O.: *See*—
Peters, Leo; and Klemm, Richard O., 4,192,991, Cl. 219-413.000.
Klendauer, Wolfgang: *See*—
Gerigk, Gunter; Klendauer, Wolfgang; Pietruck, Horst; and Hammer, Klaus-Dieter, 4,192,904, Cl. 428-36.000.
Kleuters, Wilhelm J.; Van Rosmalen, Gerard E.; Bierhoff, Martinus P. M.; and Immink, Kornelis A., to U.S. Philips Corporation. Optical videodisc read unit with tracking and focussing wobblers. 4,193,091, Cl. 358-128.500.
Kley, Richard D.: *See*—
Bastian, Lehyman J.; and Kley, Richard D., 4,192,442, Cl. 226-127.000.
Klinge, Gerald E. Hair styling implement. 4,192,326, Cl. 132-34.00R.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Berg, Josef, 4,192,261, Cl. 123-58.00B.
Klockner Ionon GmbH: *See*—
Oppel, Werner, 4,193,070, Cl. 340-650.000.
Klotz, Hermann: *See*—
Gerstenmeier, Jurgen; Klotz, Hermann; and Leiber, Heinz, 4,192,180, Cl. 73-121.000.
Kluksdahl, Harris E., to Chevron Research Company. Removal of indigenous metal impurities from an oil with phosphorus oxide-promoted alumina. 4,192,736, Cl. 208-251.00H.
Knauer, Karl; and Pfleiderer, Hans J., to Siemens Aktiengesellschaft. Transversal filter. 4,193,050, Cl. 333-165.000.
Knepper, William H., Jr., to AMF Incorporated. Bowling ball cleaner with pneumatic control of ball lift, brushes and cleaning compound. 4,192,034, Cl. 15-21.00A.
Knoke, Silas J., to Lear Siegler, Inc. Adjustable bed frame. 4,192,028, Cl. 5-181.000.
Knopf, Robert J.: *See*—
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,192,789, Cl. 260-29.20E.
Kobayashi, Shinsaku: *See*—
Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, 4,192,953, Cl. 568-673.000.
Kobayashi, Toshiro: *See*—
Hayashi, Motoshige; and Kobayashi, Toshiro, 4,192,839, Cl. 264-45.500.
Kobe Steel, Ltd.: *See*—
Godai, Tomokazu; Sugiyama, Tohru; Sugino, Morihiko; Kondo, Masaru; and Ogawa, Tsuneshi, 4,192,175, Cl. 73-19.000.
Kobori, Masanori: *See*—
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.
Koehmstedt, Paul L., to Battelle Memorial Institute. Grounding electrode and method of reducing the electrical resistance of soils. 4,192,963, Cl. 174-6.000.
Koehring Company: *See*—
Sousek, Eugene A., 4,192,103, Cl. 51-249.000.
Koering, Dale, J. Electroplating apparatus. 4,192,331, Cl. 134-77.000.
Kohl, Karl, to Karl Mayer Textilmaschinenfabrik GmbH. Weft thread tensioning device for warp knitting machines. 4,192,158, Cl. 66-146.000.
Kohl, Karl, to Karl Mayer Textilmaschinenfabrik GmbH. Apparatus for the production of loop pile ware on warp knitting machine. 4,192,159, Cl. 66-203.000.
Kohler, Fritz, to Edouard Dubied & Cie (Societe Anonyme). Knitting method and apparatus. 4,192,156, Cl. 66-64.000.
Kohnen, Hubert. Method and apparatus for position determination. 4,193,073, Cl. 343-6.00R.
Kohno, Toshihiko: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.
Koike, Susumu; Kambara, Ginjiro; and Matsuda, Toshio, to Matsushita Electronics Corporation. Non-volatile memory device. 4,193,080, Cl. 357-23.000.
Kokvik, Bjorn: *See*—
Olsen, Kolbjorn, 4,193,110, Cl. 362-371.000.
Kolchanov, Arnold P.: *See*—
Babich, Vladimir A.; Vitlin, Abram M.; Kolchanov, Arnold P.; and Sheveleva, Elena I., 4,192,489, Cl. 266-88.000.
Kolene Corporation: *See*—
Stevens, John M.; Allen, Grant W.; Cole, John M.; and Mousseau, Timothy K., 4,192,992, Cl. 219-494.000.
Koleske, Joseph V.: *See*—
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,192,789, Cl. 260-29.20E.
Komaba, Shiro: *See*—
Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 4,192,608, Cl. 355-51.000.
Komaki, Shojiro, to Kabushiki Kaisha Daini Seikosha. Electronic watch with means for producing pulse sound at selected intervals. 4,192,133, Cl. 368-73.000.
Komatsu, Toshio: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,192,773, Cl. 252-429.00R.
Komine, Kikuji: *See*—
Onodera, Takashi; Komine, Kikuji; and Ohashi, Fumio, 4,192,732, Cl. 208-33.000.
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumio; and Naito, Tsutomu, 4,192,733, Cl. 208-33.000.
Komiya, Mamoru: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.
Komoda, Tsutomu: *See*—
Futamoto, Masaaki; Kawabe, Ushio; Hosoki, Shigeyuki; Komoda, Tsutomu; and Yamamoto, Shigehiko, 4,193,013, Cl. 313-341.000.
Kompanek, Harry W., to Essex Transducers Corporation. Sensor device using piezoelectric coating subjected to bending. 4,193,010, Cl. 310-330.000.
Kompelien, Arlon D.: *See*—
Kabat, John L.; and Kompelien, Arlon D., 4,193,006, Cl. 307-117.000.
Konagai, Chikara: *See*—
Shirayama, Shimpey; Konagai, Chikara; Terasawa, Michitaka; and Kimura, Hironobu, 4,193,000, Cl. 250-385.000.
Kondo, Masaru: *See*—
Godai, Tomokazu; Sugiyama, Tohru; Sugino, Morihiko; Kondo, Masaru; and Ogawa, Tsuneshi, 4,192,175, Cl. 73-19.000.
Kondo, Tokuzo. Completely one-step permanent wave solution and a method for using the same. 4,192,863, Cl. 424-72.000.
Kondur, Nicholas, Jr.; Blomquist, James E.; and Rucinski, Roland R., to LRC, Inc. High speed ticket printer. 4,192,618, Cl. 400-124.000.
Konishi, Yoshikazu: *See*—
Aoki, Mitsugu; Konishi, Yoshikazu; and Ishihara, Taketoshi, 4,192,582, Cl. 351-30.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,192,681, Cl. 430-373.000.
Fushiki, Isamu; Kamitakahara, Atushi; and Mori, Keiichi, 4,192,680, Cl. 430-380.000.
Nishina, Yoshio; Matsuo, Syunji; Nagatani, Toshio; Takahashi, Kazuo; and Habu, Takeshi, 4,192,682, Cl. 430-405.000.
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.
Kono, Masao: *See*—
Tani, Tatsuo; and Kono, Masao, 4,192,609, Cl. 355-77.000.
Konrad, Albert. Improved closure seal and apparatus for applying the same. 4,192,043, Cl. 24-21.000.
Koontz, Ralph F.; and Klein, Lloyd E., to Magnavox Government and Industrial Electronics Company. Deferred action battery having an improved depolarizer. 4,192,913, Cl. 429-119.000.
Koppers Company, Inc.: *See*—
Hewitt, William, 4,192,559, Cl. 308-36.100.
Korber, Elmar; and Dehnert, Heinz. Tooth displacement measuring apparatus. 4,192,321, Cl. 128-776.000.

Korolkov, Konstantin I.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.

Korpel, Adrianus, to Zenith Radio Corporation. Optical detection system for simultaneously interrogating a plurality of tracks. 4,193,090, Cl. 358-128.500.

Korpics, Frank J., to AMSTED Industries Incorporated. Pedestal roof wear liner. 4,192,240, Cl. 105-225.000.

Kortbeek, Andras G. T. G.; and van der Nat, Adrianus A., to Shell Oil Company. Preparation of an active $TiCl_3$ catalyst. 4,192,774, Cl. 252-429.00B.

Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., to United Technologies Corporation. Multi-mode control system for wind turbines. 4,193,005, Cl. 290-44.000.

Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G. Fuel assembly handling system of nuclear reactor. 4,192,715, Cl. 176-30.000.

Koster, Kari: *See*—
Deibig, Heinrich; Heide, Helmut; Reiner, Roland; and Koster, Kari, 4,192,021, Cl. 3-1.900.

Kothe, Erich, to Singer Company, The. Automatic re-set pressure switch. 4,192,980, Cl. 200-83.0WM.

Kotyuk, Bernard, to Primary Design Group, Inc. Pill package. 4,192,422, Cl. 206-528.000.

Koughan, Walter L. Shock-absorbing line device. 4,192,493, Cl. 267-74.000.

Koverya, Vladimir M.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

Koyama, Mitsuaki, to Tokyo Shibaura Electric Co., Ltd. Bias voltage source for applying a bias voltage on a magnetic brush means of an electrostatic printing apparatus. 4,192,604, Cl. 355-3.0DD.

Krafka, Jerry L.: *See*—
Lawrence, Allan K.; Bass, Merlyn D.; Black, Robert D.; and Krafka, Jerry L., 4,192,468, Cl. 241-101.700.

Kramer, Arthur W.: *See*—
Calhoun, Gregory L.; Kramer, Arthur W.; Bauer, Frank I.; and Bencloski, William A., 4,192,067, Cl. 30-379.000.

Krasnoff, Eugene L.; and Lindeboom, Herman, to Ingersoll-Rand Company. Hydraulic actuator. 4,192,219, Cl. 91-276.000.

Kreger, William E.: *See*—
Crow, Dennis W.; and Kreger, William E., 4,192,500, Cl. 272-68.000.

Krekeler, Jerome H.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,192,775, Cl. 252-430.000.

Krempel, Alfred: *See*—
Bauer, Kurt; Krempel, Alfred; Molleken, Reiner; Wedemeyer, Karlfried; and Fiege, Helmut, 4,192,959, Cl. 568-764.000.

Krener, Ole G.; and Waldstrom, Ejvind, to O.G. Hoyer A/S. Apparatus for transferring frozen confections from a supply conveyor to a discharge conveyor. 4,192,415, Cl. 198-374.000.

Kridler, Edward L.; Eisenhauer, Marvin W.; and Huson, Loyal A., to Beatrice Foods Co. Barbecue grill cover positioning means. 4,192,283, Cl. 126-25.0AA.

Krieg, Adrian H. Apparatus for cutting sheet plate. 4,192,487, Cl. 266-58.000.

Kriger, Jury N.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,192,370, Cl. 164-252.000.

Krismer, Bruno; and Pungs, Harmut, to Hermann C Starck Berlin. Method of obtaining tantalum-niobium from ores having a high titanium content. 4,192,674, Cl. 75-10.00R.

Krivoshiev, Georgi P., to DSO "Bulgarplod". Control device for automatic color-sorting apparatus. 4,192,999, Cl. 250-561.000.

Kroger Co., The: *See*—
Stineman, Thomas L.; Edwards, Jeffrey D.; and Grosskopf, Jack C., 4,192,918, Cl. 435-256.000.

Kronick, Melvyn N.; Bryson, Charles E., III; Bridgham, John A.; and Eletr, Sam H., to Hewlett-Packard Company. Measurement of oxygen by differential absorption of UV radiation. 4,192,996, Cl. 250-373.000.

Krutzner, Karl, Jr., to Polysius AG. Apparatus for heat treating fine-grain solids. 4,192,643, Cl. 432-106.000.

Kubota, Atsushi: *See*—
Tsunoi, Haruo; Morikawa, Teruo; Yamada, Katsuhiko; Ohkawara, Kenji; and Kubota, Atsushi, 4,192,229, Cl. 100-158.00R.

Kudo, Yoshio: *See*—
Kato, Hisashi; Iwasa, Masakazu; and Kudo, Yoshio, 4,192,232, Cl. 101-426.000.

Kuerten, Heribert: *See*—
Rapp, Guenther; Thomas, Erwin; Wolf, Dieter; Kuerten, Heribert; and Zehner, Peter, 4,192,856, Cl. 423-387.000.

Kuntze, Richard A.: *See*—
Glass, Roger W.; and Kuntze, Richard A., 4,192,707, Cl. 162-3.000.

Kurahayashi, Sadasuke; Kato, Yuzo; Tsuda, Shin; Muto, Hakaru; and Watanabe, Asao, to Canon Kabushiki Kaisha. Facsimile apparatus. 4,193,097, Cl. 358-261.000.

Kurihara, Takao: *See*—
Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, 4,192,901, Cl. 426-580.000.

Kuris, Arthur, to Ultrasonic Plaque Control Laboratories, Inc. Ultrasonic toothbrush. 4,192,035, Cl. 15-22.00R.

Kurth, Hermann W.: *See*—
Haberle, Fritz; and Kurth, Hermann W., 4,192,039, Cl. 16-86.00B.

Kuryla, William C.; and Raines, Russell H., to Union Carbide Corporation. Print paste formulations with hydroxyalkyl carboxyalkyl cellulose. 4,192,647, Cl. 8-62.000.

Kusters, Eduard: *See*—
Appenzeller, Valentin, 4,192,050, Cl. 29-148.40D.

Kutz, Heinrich: *See*—
Zilges, Franz-Josef; and Kutz, Heinrich, 4,192,162, Cl. 72-45.000.

Kuwana, Kazutaka: *See*—
Hida, Takashi; Mitsui, Tsutomu; Hashiride, Tadaaki; and Kuwana, Kazutaka, 4,192,157, Cl. 66-76.000.

Kyu, Shikun, to Motorola, Inc. Frequency divider circuit with selectable integer/non-integer division. 4,193,037, Cl. 328-46.000.

L. Schuler GmbH: *See*—
Munch, Werner; and Mikusch, Gerald, 4,192,169, Cl. 72-405.000.

La Spirotechnique Industrielle et Commerciale: *See*—
Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, 4,192,298, Cl. 128-205.240.

Labat, Gaston: *See*—
Messines, Jean-Paul; Labat, Gaston; and Tramier, Bernard, 4,192,392, Cl. 175-66.000.

Labrecque, Leopold. Therapeutic feet bathing device. 4,192,297, Cl. 128-66.000.

Lacroix, Serge: *See*—
Dumas, Daniel; Lacroix, Serge; and Vallon, Jean, 4,192,730, Cl. 204-294.000.

Laeis-Werke Aktiengesellschaft: *See*—
Huebner, Bernhard; and Tresser, Dietfried, 4,192,167, Cl. 72-356.000.

Lafleur, Alain: *See*—
Peltre, Philippe; and Lafleur, Alain, 4,192,761, Cl. 252-99.000.

LaHaye, Peter G., to Iolab Corporation. Artificial intraocular lens with improved stave. 4,192,022, Cl. 3-13.000.

Lahr, Roy J.: *See*—
Arase, Shingo; and Lahr, Roy J., 4,193,119, Cl. 364-900.000.

Laine, Yrjo T. Safety device for doors, windows and similar. 4,192,537, Cl. 292-264.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Gilbert, Ghislain; Bentz, Gerard; and Galey, Jean, 4,192,147, Cl. 62-49.000.

Laird, James A.: *See*—
Tung, Chi F.; and Laird, James A., 4,192,576, Cl. 350-105.000.

Lamoreaux, Kenneth C., Jr. Photographic film clip. 4,192,602, Cl. 354-346.000.

Landau, Harolyn S.: *See*—
Landau, Paul H.; and Landau, Harolyn S., 4,192,425, Cl. 211-50.000.

Landau, Monroe A.: *See*—
Dam, Naim G.; and Landau, Monroe A., 4,192,318, Cl. 128-708.000.

Landau, Paul H.; and Landau, Harolyn S. Telephone accessory. 4,192,425, Cl. 211-50.000.

Landry, Henry J., Jr.: *See*—
Haverdink, Virgil D.; and Landry, Henry J., Jr., 4,192,386, Cl. 171-58.000.

Landsman, Douglas A.: *See*—
Jalan, Vinod M.; Landsman, Douglas A.; and Lee, John M., 4,192,907, Cl. 429-40.000.

Lang, Thomas; and Zoske, Karl-Heinz, to Robert Bosch GmbH. Control device for fuel-injected internal combustion engines. 4,192,272, Cl. 123-140.0MC.

Langan, John P.; and DeCicco, Michael A., to Langan, John P. Defrosting arrangement for a refrigerator. 4,192,150, Cl. 62-277.000.

Lansing Bagnall Limited: *See*—
Stroud, Robert J., 4,192,397, Cl. 180-68.500.

Lapras, Michel: *See*—
Towlerton, Richard G.; and Lapras, Michel, 4,192,886, Cl. 424-283.000.

Laptev, Fedor V.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.

LaRocque, Arthur G.; Whiteside, George D.; and Johnson, Bruce K., to Polaroid Corporation. Proportional fill flash. 4,192,587, Cl. 354-27.000.

Larsson, Leif T.: *See*—
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, 4,192,490, Cl. 266-225.000.

Lassau, Christian: *See*—
Hillion, Gerard; and Lassau, Christian, 4,192,960, Cl. 568-816.000.

Latina, Roland N., to A-T-O Inc. Baseball glove. 4,192,018, Cl. 2-19.000.

Lau, Edward H., to Redactron Corporation. Electronically controlled printer system. 4,192,619, Cl. 400-163.000.

Laude, Pierre; Marka, Erwin; and Zuntini, Franco, to Systemes de Traitements de Surfaces S.A. Aqueous solution of monovalent gold and ammonium sulfite complex, process for the preparation thereof and electrolytic bath obtained therefrom for the plating of gold or gold alloys. 4,192,723, Cl. 204-43.00G.

Laudig, Ronald C.; and Morelli, John A., to AMP Incorporated. Antenna lead splice. 4,192,566, Cl. 339-47.00R.

Laureano, Angel F., to Bel Air Aluminum Manufacturing, Inc. Push-pull door latch. 4,192,536, Cl. 292-228.000.

Laurie, Archibald M.: *See*—
Maly, George P.; and Laurie, Archibald M., 4,192,375, Cl. 166-51.000.

La Via, Anthony L.: *See*—
Chen, James L.; Cilento, Rudolfo D.; Hill, John A.; and La Via, Anthony L., 4,192,785, Cl. 260-17.4GC.

Lavigne, Raymond G.: *See*—
Kimura, Shiro G.; Lavigne, Raymond G.; and Browall, Warella R., 4,192,842, Cl. 264-298.000.

Lawrence, Alan J.: *See*—
Williams, Roger M.; and Lawrence, Alan J., 4,192,973, Cl. 370-53.000.

Lawrence, Allan K.; Bass, Merlyn D.; Black, Robert D.; and Krafka, Jerry L., to Deere & Company. Feed roll assembly for a forage harvester. 4,192,468, Cl. 241-101.700.

Lawther, James M.: *See*—
Kendig, Paul M.; Lawther, James M.; and James, Robert G., 4,192,245, Cl. 114-23.000.

Lazaretnik, Avram S.: *See*—
Vasilevsky, Petr N.; Gekhman, Boris S.; Parfinenko, Ivan V.; Podgursky, Alfred M.; and Lazaretnik, Avram S., 4,192,294, Cl. 128-1.00R.

Lazier, Samuel S.: *See*—
Kennedy, Russell J.; Lazier, Samuel S.; and Zorzi, Joe, 4,192,187, Cl. 73-321.000.

Leach, Byron E., deceased; and by Leach, Ellanor L., executrix. Method of using dialkylphenols in the treatment of mycoplasma diseases. 4,192,896, Cl. 424-346.000.

Leach, Ellanor L., executrix: *See*—
Leach, Byron E., deceased; and Leach, Ellanor L., executrix, 4,192,896, Cl. 424-346.000.

Lear Siegler, Inc.: *See*—
Austermann, John F., Jr.; and Pack, Jerome E., 4,192,396, Cl. 180-252.000.
Knoke, Silas J., 4,192,028, Cl. 5-181.000.

Leclanche S.A.: *See*—
Ruetschi, Paul, 4,192,914, Cl. 429-206.000.

Lectron Products, Inc.: *See*—
Slavin, Michael; and Rea, Irvin B., 4,193,060, Cl. 340-52.00D.

Lederer, Michael; and Bouman, Antonius J. M., to Hoechst Aktiengesellschaft. Suspension polymerization. 4,192,797, Cl. 525-243.000.

Lee, Arthur L.; and Coval, Arthur B., to A. L. Lee Corporation. Spring applied brake mechanism. 4,192,405, Cl. 188-170.000.

Lee, John M.: *See*—
Jalan, Vinod M.; Landsman, Douglas A.; and Lee, John M., 4,192,907, Cl. 429-40.000.

Lee, Robert G. H.: *See*—
Savard, Guy; Lee, Robert G. H.; and Hornsey, Derek, 4,192,740, Cl. 210-3.000.

Leeds & Northrup Company: *See*—
Hitt, James J.; and Mergner, George C., 4,193,063, Cl. 340-200.000.

Legressus, Claude: *See*—
Blanchard, Bruno; Legressus, Claude; Massignon, Daniel; Sopizet, Rene; and Stefani, Rene, 4,193,003, Cl. 250-492.00A.

Lehner, Theo: *See*—
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, 4,192,490, Cl. 266-225.000.

Leiber, Heinz, to Robert Bosch GmbH. Pneumatic-hydraulic brake system for vehicles. 4,192,557, Cl. 303-114.000.

Leiber, Heinz: *See*—
Gerstenmeier, Jurgen; Klotz, Hermann; and Leiber, Heinz, 4,192,180, Cl. 73-121.000.

Lemchen, Marc S.; Chong, Ian M.; and Klein, Carlton. Orthodontic devices. 4,192,070, Cl. 433-11.000.

Lemke, James U.: *See*—
Bixby, James A.; Lemke, James U.; and Lentz, Robert A., 4,193,098, Cl. 360-10.000.

Lempa, Roman F., to Selas Corporation of America. Universal pilot assembly. 4,192,642, Cl. 431-263.000.

Lendle, Wilhelm: *See*—
Graser, Reinhold; Lendle, Wilhelm; and Post, Hendrik W., 4,192,821, Cl. 260-652.00P.

Leney, Thomas F.: *See*—
Schwartz, Edward C.; and Leney, Thomas F., 4,193,074, Cl. 343-16.00M.

Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., to International Business Machines Corporation. Cryptographic verification of operational keys used in communication networks. 4,193,131, Cl. 375-2.000.

Lentz, Robert A.: *See*—
Bixby, James A.; Lemke, James U.; and Lentz, Robert A., 4,193,098, Cl. 360-10.000.

Leroy, Pierre J.: *See*—
Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.

Lever Brothers Company: *See*—
Pengilly, Roger W., 4,192,862, Cl. 424-47.000.

Levi Strauss & Co.: *See*—
Blessing, Hubert; and Allison, Gaylord D., 4,192,243, Cl. 112-273.000.

Levkovitch, Shimon N. Device for displaying samples of drapes, fabrics or other textile products. 4,192,563, Cl. 312-134.000.

Levy, Dudley D. Device for vaporizing liquid hydrocarbon fuel. 4,192,269, Cl. 123-122.00F.

Levy, Michael: *See*—
Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., 4,193,112, Cl. 364-200.000.

Lewandowski, Joseph T.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,192,780, Cl. 252-518.000.

Lewicki, Gregory D.: *See*—
Lewicki, Stephen; Lewicki, Gregory D.; and Lewicki, Stephen J., 4,192,699, Cl. 156-145.000.

Lewicki, Stephen; Lewicki, Gregory D.; and Lewicki, Stephen J. Method of making inflatable cellular assemblies of plastic material. 4,192,699, Cl. 156-145.000.

Lewicki, Stephen J.: *See*—
Lewicki, Stephen; Lewicki, Gregory D.; and Lewicki, Stephen J., 4,192,699, Cl. 156-145.000.

Lewis, Bernard. Combination copy machine and microfilm camera. 4,192,606, Cl. 355-40.000.

Leybold-Hereaus GmbH: *See*—
Aichert, Hans; Stark, Friedrich; Stephan, Herbert; and Hoffmann, Otto-Horst, 4,192,253, Cl. 118-712.000.

Lezier, Gerard; and Vasseur, Bernard. Molding device having heat transfer chambers insulated from each other for molding expandable thermoplastic resin particles. 4,192,638, Cl. 425-256.000.

Liebetruth, Reiner; and Mika, Norbert, to Siemens Aktiengesellschaft. Tomographic apparatus for producing transverse layer images. 4,193,001, Cl. 250-445.00T.

Liedtke, Ronald R., to Schick Incorporated. Hair styling appliance including improved bayonet fasteners for assembling same. 4,192,325, Cl. 132-9.000.

Lindauer Dornier Gesellschaft mbH: *See*—
Gageur, Fritz; and Trotscher, Gerhard, 4,192,251, Cl. 118-63.000.

Lindeboom, Herman: *See*—
Krasnoff, Eugene L.; and Lindeboom, Herman, 4,192,219, Cl. 91-276.000.

Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Hardt, Dietrich, to Bayer Aktiengesellschaft. Polyesters which can be prepared by reacting a carbonic acid aryl ester with a polyester prepared from a polyhydric alcohol and a polybasic carboxylic acid which is aliphatic. 4,192,940, Cl. 528-370.000.

Linford, John R.: *See*—
Nash, Harold G.; and Linford, John R., 4,193,118, Cl. 364-734.000.

Lingenfelter, Ralph E., to Holston Manufacturing Company. Minisock. 4,192,019, Cl. 2-239.000.

Lisle, Thomas K., Jr.: *See*—
Morrison, Steven; Lisle, Thomas K., Jr.; and Glover, Clarence C., 4,193,066, Cl. 340-347.0CC.

Lissmyr, Per O. Shutting-off device. 4,192,376, Cl. 166-53.000.

Livick, Lester R. Magnetic ball game. 4,192,508, Cl. 273-118.00A.

Lobdell, Donn D.; Herman, Stephen J.; Anderson, Robert L.; and Goyne, Thomas E., to Cobe Laboratories, Inc. Fluid level monitoring through fluid cell protrusion. 4,193,004, Cl. 250-577.000.

Lobermann, Claude; and Croitoriu, Jean-Claude, to Automation 2000 S.A. Transformer protective device. 4,192,174, Cl. 73-19.000.

Locks, William S.: *See*—
Weimer, James C.; Locks, William S.; Wilson, Edwin B.; and Miller, Francis G., 4,192,551, Cl. 299-1.000.

Logan, Maurus C.; Cole, John M.; and Garner, Peter, to Thomas & Betts Corporation. Assembly tool. 4,192,056, Cl. 29-468.000.

Lombard, Didier, to Dosapro Milton Roy. Adjustment device, notably for metering reciprocating pumps. 4,192,223, Cl. 92-5.00R.

London Laboratories Limited Co.: *See*—
Soltys, Joseph F., 4,192,686, Cl. 106-1.230.

Longo, John M.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,192,780, Cl. 252-518.000.

Lorac Company, The: *See*—
Tremblay, Joseph A., 4,192,903, Cl. 428-8.000.

Lorain Products Corporation: *See*—
Kiko, Frederick J., 4,192,974, Cl. 179-16.00F.

Lore, Corrado: *See*—
Lore, Nicola; and Lore, Corrado, 4,192,078, Cl. 33-414.000.

Lore, Nicola; and Lore, Corrado. Automatically retractable chalk and plumb line assembly. 4,192,078, Cl. 33-414.000.

Losert, Gerhard K., to General Electric Company. Load equalizing support system. 4,192,564, Cl. 312-253.000.

Lovell, Peter J.; and Saunders, Ian C. B., to DuPont of Canada Limited. Ethylene polymers of high melt index. 4,192,935, Cl. 526-348.600.

Lowe, Colin F. Frameless metal building. 4,192,108, Cl. 52-90.000.

LRC, Inc.: *See*—
Kondur, Nicholas, Jr.; Blomquist, James E.; and Rucinski, Roland R., 4,192,618, Cl. 400-124.000.

Lu, Chin H., to Xerox Corporation. In situ coating then spray drying of magnetic toner. 4,192,902, Cl. 427-127.000.

Lubrizol Corporation, The: *See—*
Jahnke, Richard W., 4,192,769, Cl. 252-389.00R.

Lucas, Donald M.: *See—*
Cloyd, Grover D.; Miller, Robert L.; and Lucas, Donald M., 4,192,887, Cl. 424-283.000.

Ludwig Peithmann KG: *See—*
Keilholz, Friedrich, 4,192,185, Cl. 73-243.000.

Lupoi, Vincent, to PPG Industries, Inc. Method of producing glass-ceramics with uniform brown stain decoration. 4,192,666, Cl. 65-33.000.

Lynchak, Kima A.: *See—*
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

M.U. Engineering & Mfg. Co.: *See—*
Sherlock, Hugh P., 4,192,295, Cl. 128-295.000.

MacDonald, Robert D., to Du Pont de Nemours, E. I., and Company. Method for bonding a heat exchanger fin to a tube. 4,192,052, Cl. 29-157.30A.

Mackaness, George B.; and Hou, Joseph P., to E. R. Squibb & Sons, Inc. Contrast media containing liposomes as carriers. 4,192,859, Cl. 424-5.000.

MacLaury, Michael R., to General Electric Company. Dehydrohalogenation of a diphenyl trichloroethane. 4,192,956, Cl. 568-726.000.

MacLaury, Michael R., to General Electric Company. Dehydrohalogenation of a diphenyl trichloroethane. 4,192,957, Cl. 568-726.000.

Madaliev, Shavkat: *See—*
Varlamov, Gennady D.; Mamatov, Juldash; Bekbulatov, Ildgam A.; and Madaliev, Shavkat, 4,192,931, Cl. 525-489.000.

Madhavan, Narayanan; and Freeman, Frank H., to Sybron Corporation. Barium aluminum silicate filler for U.V. curable composites. 4,192,795, Cl. 260-42.520.

Madsen, Bruce S., to Western Electric Company, Inc. Stabilizing composition for a metal deposition process. 4,192,764, Cl. 430-455.000.

Maeda, Takashi: *See—*
Hayashi, Torahiko; Maeda, Takashi; and Morikawa, Michio, 4,192,636, Cl. 425-96.000.

Magnavox Government and Industrial Electronics Company: *See—*
Koontz, Ralph F.; and Klein, Lloyd E., 4,192,913, Cl. 429-119.000.

Mahalla, Shalom. Metal crystals and process. 4,192,695, Cl. 148-32.000.

Maher, John P.; and Jacobsen, Robert T., to Sprague Electric Company. Making an electroding ink for a monolithic ceramic capacitor. 4,192,698, Cl. 156-89.000.

Mainord, Kenneth R., to Eastman Kodak Company. Emulsifiable ethylene/carbon monoxide copolymer waxes. 4,192,942, Cl. 260-597.00R.

Maiocchi, Luigi, to Industrie Pirelli S.p.A. Tire core bead for tubeless tires. 4,192,368, Cl. 152-362.00R.

Maisch, Wolfgang; and Burkel, Rainer, to Robert Bosch GmbH. Method and apparatus for automatic engine shut-off and restart. 4,192,279, Cl. 123-198.00F.

Makino, Fusao: *See—*
Morita, Toshiaki; Takatori, Hironari; Makino, Fusao; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,193,056, Cl. 340-146.3AC.

Makino, Naoji: *See—*
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, 4,192,793, Cl. 260-42.140.

Makrides, Alkis C.: *See—*
Harvey, Walter W.; and Makrides, Alkis C., 4,192,854, Cl. 423-220.000.

Malm, Elisabeth: *See—*
Thorsell, Walborg; Mikiver, Maarja; Malm, Elisabeth; and Wennberg, Lennart, 4,192,892, Cl. 424-324.000.

Maly, George P.; and Laurie, Archibald M., to Union Oil Company of California. Gravel-packing tool assembly. 4,192,375, Cl. 166-51.000.

Mamatov, Juldash: *See—*
Varlamov, Gennady D.; Mamatov, Juldash; Bekbulatov, Ildgam A.; and Madaliev, Shavkat, 4,192,931, Cl. 525-489.000.

Mannesmann AG: *See—*
Bade, Werner; Gelsdorf, Gunther; and Wieland, Gunther, 4,192,687, Cl. 106-38.240.

Mansell, John D.: *See—*
Rideout, Walker H.; and Mansell, John D., 4,192,823, Cl. 260-658.00R.

Mar-Pha Societe d'Etudes et d'Exploitation de Marques: *See—*
Brown, Eric; Boschetti, Egisto; Corgier, Monique M.; and Touet, Joel, 4,192,784, Cl. 260-8.000.

Marckwardt, Werner, to Jenoptik Jena G.m.b.H. Electronic correlator. 4,193,117, Cl. 364-728.000.

Marhofer, Gerd: *See—*
Buck, Robert; and Marhofer, Gerd, 4,193,023, Cl. 323-19.000.

Marka, Erwin: *See—*
Laude, Pierre; Marka, Erwin; and Zuntini, Franco, 4,192,723, Cl. 204-43.00G.

Markovsky, Evgeny A.: *See—*
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

Marks, Richard L.; and Weidler, Charles H., to AMP Incorporated. Connector assembly and improved connector plug. 4,192,568, Cl. 339-91.00R.

Marondel, Gunter: *See—*
Gawlick, Heinz; Marondel, Gunter; and Siegelin, Werner, 4,192,837, Cl. 264-3.00E.

Marsh, Harry A., Jr., to Dresser Industries, Inc. Device for fabrication of tapholes in metallurgical vessels. 4,192,492, Cl. 266-281.000.

Marshall, Alan: *See—*
Clark, David R.; Marshall, Alan; and Finan, Michael A., 4,192,744, Cl. 210-54.000.

Marshall, Robert M.; and Dardoufas, Kimon C., to Allied Chemical Corporation. Soil resistant yarn finish composition for synthetic organic polymer yarn. 4,192,754, Cl. 252-8.800.

Martin, Alan. Tool for setting blind fasteners. 4,192,163, Cl. 72-114.000.

Martin, Eugene J.: *See—*
Otteson, Jack O.; and Martin, Eugene J., 4,192,399, Cl. 180-170.000.

Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, to Abbott Laboratories. 2-Deoxyfortimicin A, 4-N-alkyl and 4-N-acyl-2-deoxyfortimicin B derivatives. 4,192,867, Cl. 424-180.000.

Martin, Mulford, Jr., to Armco Inc. Corner assembly for wall panels. 4,192,113, Cl. 52-282.000.

Martin, Raymond H.; and Brushaber, Larry R. Double wall plastic article and method and apparatus for forming a double wall plastic article with a pair of thermoplastic sheets. 4,192,701, Cl. 156-285.000.

Maru, Hansraj C., to Energy Research Corporation. Electrochemical cell operation and system. 4,192,906, Cl. 429-13.000.

Marvin Glass & Associates: *See—*
Erickson, Erick E.; and Breslow, Jeffrey D., 4,192,512, Cl. 273-243.000.
Meyer, Burton C., 4,192,580, Cl. 350-238.000.

Masakazu, Kurihara: *See—*
Gensho, Takahashi; Masamitsu, Yanai; Masakazu, Kurihara; Yoneharu, Tanaka; and Kazuhiro, Suzuoki, 4,192,684, Cl. 430-284.000.

Masamitsu, Yanai: *See—*
Gensho, Takahashi; Masamitsu, Yanai; Masakazu, Kurihara; Yoneharu, Tanaka; and Kazuhiro, Suzuoki, 4,192,684, Cl. 430-284.000.

Masciopinto, Anthony J.: *See—*
Kirkland, Kerry G.; and Masciopinto, Anthony J., 4,192,383, Cl. 166-341.000.

Mason & Hanger-Silas Mason Co., Inc.: *See—*
Wait, Henry J., 4,192,216, Cl. 89-40.00B.

Massa, Richard L.; and Cook, Kenneth J., to Valeron Corporation, The. Automatic zeroing system. 4,193,039, Cl. 328-162.000.

Massachusetts General Hospital: *See—*
Savarese, John J.; Kitz, Richard J.; and Ginsburg, Sara, 4,192,877, Cl. 424-258.000.
Zurawski, Vincent R., Jr., 4,192,917, Cl. 435-236.000.

Massachusetts Institute of Technology: *See—*
Kaplow, Roy; and Frank, Robert I., 4,193,081, Cl. 357-30.000.

Massaro, Anthony A., Jr.: *See—*
Blanco, Rodney A.; and Massaro, Anthony A., Jr., 4,192,053, Cl. 29-157.400.

Massey-Ferguson Inc.: *See—*
Elfes, Lee E.; and Wood, Dale A., 4,192,750, Cl. 210-133.000.

Massey-Ferguson Services N.V.: *See—*
Allely, Robert, 4,192,123, Cl. 56-13.600.
Hausmann, Winfried, 4,192,523, Cl. 280-400.000.

Massignon, Daniel: *See—*
Blanchard, Bruno; Legressus, Claude; Massignon, Daniel; Sopizet, Rene; and Stefani, Rene, 4,193,003, Cl. 250-492.00A.

Masson, Jean-Marcel: *See—*
Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.

Masukawa, Toyoaki: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,192,681, Cl. 430-373.000.

Masuya, Terumasa: *See—*
Masuya, Yoshiaki; and Masuya, Terumasa, 4,192,344, Cl. 137-489.300.

Masuya, Yoshiaki; and Masuya, Terumasa. Automatic emergency stop apparatus against counter flow and counter fire of gas bodies. 4,192,344, Cl. 137-489.300.

Masuzima, Sho; and Fujita, Hisashi, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Process and apparatus for manufacture of parallel lead electronic components. 4,192,061, Cl. 29-854.000.

Mathieu, Pierre: *See—*
Tellier, Jacques; Philippe, Andre; Mathieu, Pierre; and Voirin, Robert, 4,192,857, Cl. 423-576.000.

Matsuda, Toshio: *See—*
Koike, Susumu; Kambara, Ginjiro; and Matsuda, Toshio, 4,193,080, Cl. 357-23.000.

Matsumoto, Hiromitsu: *See—*
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, 4,192,140, Cl. 60-277.000.

Matsumoto, Junichiro: *See—*
Iizuka, Haruhiko; Sugasawa, Fukashi; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,192,278, Cl. 123-198.00F.

Matsumoto, Katsuhiko: *See—*
Higuchi, Kazuo; and Matsumoto, Katsuhiko, 4,192,545, Cl. 297-216.000.

Matsuo, Masataka, to Nippon Steel Corporation. Refractory powder flame projecting apparatus. 4,192,460, Cl. 239-79.000.

Matsuo, Syunji: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,192,681, Cl. 430-373.000.
Nishina, Yoshio; Matsuo, Syunji; Nagatani, Toshio; Takahashi, Kazuo; and Habu, Takeshi, 4,192,682, Cl. 430-405.000.

Matsushita Electronics Corporation: *See—*
Koike, Susumu; Kambara, Ginjiro; and Matsuda, Toshio, 4,193,080, Cl. 357-23.000.

Matsuzawa, Toshihiko: *See—*
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, 4,192,793, Cl. 260-42.140.

Mattern, Gunter: *See—*
Clauson-Kaas, Niels; Mattern, Gunter; and Traber, Walter, 4,192,946, Cl. 546-249.000.

Matthews, Donald P.: *See—*
Wagner, Eugene R.; and Matthews, Donald P., 4,192,884, Cl. 424-275.000.

Matyas, Stephen M.: *See—*
Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., 4,193,131, Cl. 375-2.000.

Maulhardt, Hans-Joachim: *See—*
Junger, Rudolf; and Maulhardt, Hans-Joachim, 4,192,760, Cl. 252-79.000.

Max, Lee B., to Varian Associates, Inc. Package for push-pull semiconductor devices. 4,193,083, Cl. 357-80.000.

May, Peter J.: *See—*
Phillipps, Gordon H.; May, Peter J.; and Ayres, Barry E., 4,192,871, Cl. 424-241.000.

Mayer, Max, to Siemens Aktiengesellschaft. Circuit arrangement for determining specific characters occurring directly consecutively in a sequence of characters, in particular for teleprinter exchange systems. 4,192,966, Cl. 178-3.000.

Maytag Company, The: *See—*
Jordan, Lawrence J., 4,192,432, Cl. 220-83.000.

McAndrew, James R. Utility arch. 4,192,069, Cl. 433-21.000.

McCoin, Dan K., to Bales-McCoin Research, Inc. Variable ratio gear transmission. 4,192,200, Cl. 74-690.000.

McCoin, Dan K., to Bales-McCoin Research, Inc. Traction controlled in-line transmission. 4,192,201, Cl. 74-690.000.

McComb, Barry P. Bidets or like apparatus. 4,192,023, Cl. 4-7.000.

McCort, Ralph E., to Owens-Corning Fiberglas Corporation. Seals for ovens. 4,192,516, Cl. 277-12.000.

McCracken, John, to Vought Corporation. Fragmentation explosive structure having elongated fragments. 4,192,234, Cl. 102-67.000.

McCullough, John E.: *See—*
Armstrong, Allen E.; and McCullough, John E., 4,192,152, Cl. 62-402.000.

McElroy, Kenneth W. Motorcycle battery indicator. 4,192,909, Cl. 429-91.000.

McEwan, John A. Jump-proof electrical disenabling system. 4,192,400, Cl. 180-287.000.

McFarlane, James D.: *See—*
Patton, Franklin D.; and McFarlane, James D., 4,192,181, Cl. 73-155.000.

McKay, Frank F., Jr.: *See—*
Worrell, G. Richard; and McKay, Frank F., Jr., 4,192,656, Cl. 48-192.000.

McKinstry, Paul H.; and Barnhart, Robert R., to Uniroyal, Inc. Elastomeric composition having reduced Mooney viscosity. 4,192,790, Cl. 260-31.2MR.

McKusick, Wayne L., to United States of America, Navy. Combination infrared radio fuze. 4,193,072, Cl. 343-6.0ND.

McLaren, Edwin C., to Champion International Corporation. Divided paperboard tray. 4,192,443, Cl. 229-28.00R.

McMillan, William R.: *See—*
Antoniuk, Andrew V.; Hankinson, Lawrence V.; Boulter, David M.; and McMillan, William R., 4,192,228, Cl. 100-37.000.

McVicker, Gary B.; and Vannice, M. Albert, to Exxon Research & Engineering Co. Preparation and use of supported potassium (or rubidium)-Group VIII-metal cluster catalysts in CO/H_2 Fischer-Tropsch synthesis reactions. 4,192,777, Cl. 252-447.000.

Mead Corporation, The: *See—*
Oliff, James R., 4,192,540, Cl. 294-87.200.

Mearl Corporation, The: *See—*
Armanini, Louis, 4,192,691, Cl. 106-291.000.

Meevis, Martinus H. J.: *See—*
van den Bosch-Meevis, Henriette M. J.; and Meevis, Martinus H. J., 4,192,046, Cl. 28-151.000.

Megahed, Shenoda S., to Becton, Dickinson and Company. Adapter for syringe. 4,192,320, Cl. 128-764.000.

Megles, John E., Jr.: *See—*
Chyung, Kenneth; and Megles, John E., Jr., 4,192,665, Cl. 65-33.000.

Meier, Jean: *See—*
Allais, Andre; Meier, Jean; and Dube, Jacques, 4,192,890, Cl. 424-308.000.

Meinke, James M., to Bell Telephone Laboratories, Incorporated. Fault detection in data rate conversion systems using a first-in, first-out buffer. 4,193,123, Cl. 364-900.000.

Meissner, Bernd; Fliege, Werner; Woerz, Otto; Dudeck, Christian; and Diehm, Hans, to BASF Aktiengesellschaft. Preparation of 3-methyl-2-buten-1-al. 4,192,820, Cl. 260-601.00R.

Melby, William E.; Isdale, Charles E., Sr.; and Collins, Vernon K., to A. H. Robins Company, Incorporated. Process for producing defatted heparin tissue for heparin production. 4,192,916, Cl. 435-274.000.

Memoli, Adriana: *See—*
Botre, Claudio; Bolasco, Franco; Memoli, Adriana; and Molteni, Luigi, 4,192,894, Cl. 424-329.000.

Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, to BBC Brown Boveri & Company Limited. Permanent-magnet alloy. 4,192,696, Cl. 148-101.000.

Mercier, Jacques H., to Normand Trust. Pressure vessel. 4,192,350, Cl. 138-30.000.

Merck & Co., Inc.: *See—*
Cheng, Hsiung, 4,192,900, Cl. 426-579.000.
Veber, Daniel F.; and Freidinger, Roger M., 4,192,875, Cl. 424-256.000.

Merger, Franz; Towae, Friedrich; and Schroff, Ludwig, deceased (by Schroff, Meinie T., heiress-at-law), to BASF Aktiengesellschaft. Preparation of aralkyl phenyl ethers and alkyl phenyl ethers. 4,192,949, Cl. 560-67.000.

Mergner, George C.: *See—*
Hitt, James J.; and Mergner, George C., 4,193,063, Cl. 340-200.000.

Merianos, John J.: *See—*
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,192,817, Cl. 260-513.00N.

Merry, Glenn W., to Winter Park Associates. Multiple transfer process and article resulting therefrom. 4,192,640, Cl. 430-248.000.

Mersek, Leo D.; and Rettig, Peter P., to Ajax Manufacturing Company, The. Forging machine transfer for heavy workpieces. 4,192,172, Cl. 72-420.000.

Messer Griesheim GmbH: *See—*
Roeder, Georg; Sachs, Helmut; and Hajok, Dieter, 4,192,488, Cl. 266-77.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Heinrich, Wilhelm, 4,192,475, Cl. 244-3.160.

Messines, Jean-Paul; Labat, Gaston; and Tramier, Bernard, to Societe Nationale Elf Aquitaine (Production). Recovery of drilling fluids. 4,192,392, Cl. 175-66.000.

Metabowerke GmbH & Co.: *See—*
Schnizler, Albrecht, Jr.; and Kieser, Hermann, 4,192,982, Cl. 200-157.000.

Meyer, Adolf; and Gutfleisch, Peter O., to Portland-Zementwerke Heidelberg A.G. Fiber-reinforced hydraulically hardenable shaped objects. 4,192,690, Cl. 106-99.000.

Meyer, Bruno P.: *See—*
Decky, John R.; and Meyer, Bruno P., 4,192,477, Cl. 248-56.000.

Meyer, Burton C., to Marvin Glass & Associates. Toy microscope. 4,192,580, Cl. 350-238.000.

Meyer, Carl H. W.: *See—*
Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., 4,193,131, Cl. 375-2.000.

Micchelli, Albert L.; Nowak, Frank A., Jr.; and Ganslaw, Stuart H., to National Starch and Chemical Corporation. Hydrocarbon propelled aerosol hair spray compositions. 4,192,861, Cl. 424-47.000.

Michaels, Alan S., to Alza Corporation. Device using prestretched polymer for dispensing medication. 4,192,308, Cl. 128-260.000.

Michel, Dominique; and Noblanc, Alain G. N., to Compagnie Generale pour les Developpements, FRX. Assembly positioning a crane on a platform installed in the sea. 4,192,110, Cl. 52-111.000.

Michele, Joseph V.: *See—*
Campos, Adolph A.; and Michele, Joseph V., 4,192,634, Cl. 418-61.00A.

Miesen, Ernest: *See—*
Broecker, Franz J.; Duembgen, Gerd; Glietenberg, Helmut; Miesen, Ernest; and Schwarzmann, Matthias, 4,192,807, Cl. 260-343.600.

Mika, Norbert: *See—*
Liebetruth, Reiner; and Mika, Norbert, 4,193,001, Cl. 250-445.00T.

Miki, Masayoshi: *See—*
Takahashi, Tsukasa; Sekihara, Takeshi; Emura, Tomoyuki; and Miki, Masayoshi, 4,192,934, Cl. 526-62.000.

Mikiver, Maarja: *See—*
Thorsell, Walborg; Mikiver, Maarja; Malm, Elisabeth; and Wennberg, Lennart, 4,192,892, Cl. 424-324.000.

Mikusch, Gerald: *See—*
Munch, Werner; and Mikusch, Gerald, 4,192,169, Cl. 72-405.000.

Milberger, Walter E.; and Wright, Larry G., to United States of America, Air Force. High speed transmitter pulser. 4,193,032, Cl. 178-116.000.

Millar, Douglas A. J.: *See—*
Chappell, Marcus S.; and Millar, Douglas A. J., 4,192,137, Cl. 60-39.16R.

Miller, Arthur F.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,192,776, Cl. 252-432.000.

Miller, Francis G.: *See—*
Weimer, James C.; Locks, William S.; Wilson, Edwin B.; and Miller, Francis G., 4,192,551, Cl. 299-1.000.

Miller, Franklin C. Apparatus for simulating game of golf. 4,192,510, Cl. 273-176.00A.

Miller, Joseph A.: *See—*
Baselice, Louis R.; Freakes, Anthony; Miller, Joseph A.; and Ventz, George A., 4,192,496, Cl. 271-10.000.

Miller, Robert L.: *See—*
Cloyd, Grover D.; Miller, Robert L.; and Lucas, Donald M., 4,192,887, Cl. 424-283.000.

Millet, Marcus J., to Johnson & Johnson. Intravenous catheter assembly with fluid flow restriction capability. 4,192,304, Cl. 128-214.400.

Mima, Rikichi, to Miwa Gomu Kogyo Kabushiki Kaisha. Cutter mat and method of making same. 4,192,494, Cl. 269-289.00R.

Mimura, Masahisa: *See*—
Tanaka, Atsushi; Shinoda, Toshihiko; and Mimura, Masahisa, 4,192,928, Cl. 521-177.000.

Minami, Takeshi; and Toda, Shinichi, to Chlorine Engineers Corporation, Ltd. Method for electrolyzing molten metal chlorides. 4,192,724, Cl. 204-67.000.

Minnesota Mining and Manufacturing Company: *See*—
Tung, Chi F.; and Laird, James A., 4,192,576, Cl. 350-105.000.

Minolta Camera Kabushiki Kaisha: *See*—
Kitaura, Mashio, 4,192,590, Cl. 354-53.000.
Ogino, Shuji, 4,192,577, Cl. 350-184.000.

Mironov, Vladimir F.: *See*—
Sheludyakov, Viktor D.; Kirilin, Alexei D.; Mironov, Vladimir F.; Glushakov, Sergei N.; and Karpman, Yakov S., 4,192,815, Cl. 260-453.00P.

Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, to Sankyo Company Limited. Polyprenyl derivatives. 4,192,953, Cl. 568-673.000.

Mitchell, John R. Saw horse brace. 4,192,406, Cl. 182-185.000.

Mitchell, Lawrence C.: *See*—
Barker, Henry P.; and Mitchell, Lawrence C., 4,192,954, Cl. 568-723.000.

Mitchell, Paul: *See*—
Brougham, Robert W.; and Mitchell, Paul, 4,193,089, Cl. 358-111.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Hashimoto, Tsutomu; and Nakamura, Nobuhiro, 4,192,452, Cl. 235-471.000.
Shibayama, Kyoichi; Okahashi, Kazuo; and Hayashi, Osamu, 4,192,786, Cl. 260-18.0EP.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,192,773, Cl. 252-429.00R.

Mitsui Petrochemical Industries Ltd.: *See*—
Hashimoto, Isao; Nakagawa, Hiroaki; and Nambu, Hirohiko, 4,192,958, Cl. 568-763.000.

Mitsui, Tsutomu: *See*—
Hida, Takashi; Mitsui, Tsutomu; Hashiride, Tadaaki; and Kuwana, Kazutaka, 4,192,157, Cl. 66-76.000.

Miura, Seishi: *See*—
Ishihara, Takeo; and Miura, Seishi, 4,192,276, Cl. 123-179.00K.

Miwa Gomu Kogyo Kabushiki Kaisha: *See*—
Mima, Rikichi, 4,192,494, Cl. 269-289.00R.

Mixich, Johann; and Jastrow, Horst, to Hoechst Aktiengesellschaft. Finely divided expandable styrene polymers. 4,192,922, Cl. 521-56.000.

Mixon, James L., Jr.; and Sherman, Mark L. Support device for musical instruments. 4,192,214, Cl. 84-327.000.

Miyajima, Toru: *See*—
Nakao, Kozaburo; and Miyajima, Toru, 4,192,962, Cl. 13-7.000.

Mizushima, Masashi, to Hitachi, Ltd. Driver system of memory type gray-scale display panel. 4,193,095, Cl. 358-241.000.

Mo och Domsjo Aktiebolag: *See*—
Bergstrom, John R.; Hultman, Bengt G.; and Dalborg, Astrid T. P., 4,192,708, Cl. 162-49.000.

Mobil Oil Corporation: *See*—
Pavlica, Robert T.; Stein, Thomas R.; and Streed, Carl W., 4,192,734, Cl. 208-80.000.
Salmon, Howard J., 4,192,787, Cl. 260-21.000.
Smith, Clarence G., 4,193,058, Cl. 367-71.000.

Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., to Bayer Aktiengesellschaft. Preparation of polyisocyanates containing biuret groups. 4,192,936, Cl. 528-59.000.

Moldas, Richard P.: *See*—
Kelley, John S.; and Moldas, Richard P., 4,192,244, Cl. 113-121.00C.

Molleken, Reiner: *See*—
Bauer, Kurt; Krempel, Alfred; Molleken, Reiner; Wedemeyer, Karlfried; and Fiege, Helmut, 4,192,959, Cl. 568-764.000.

Molteni, Luigi: *See*—
Botre, Claudio; Bolasco, Franco; Memoli, Adriana; and Molteni, Luigi, 4,192,894, Cl. 424-329.000.

Mondshine, Thomas C., to Texas Brine Corporation. Anticaking of sodium chloride and potassium chloride. 4,192,756, Cl. 252-8.55R.

Monte, Salvatore J.: *See*—
Sugerman, Gerald; and Monte, Salvatore J., 4,192,792, Cl. 260-42.140.

Montgomery, Max L. Auger conveyer. 4,192,418. Cl. 198-659.000.

Moog Inc.: *See*—
Replogle, Douglas L., 4,192,527, Cl. 280-618.000.

Moore, Donn F., to Computer Peripherals, Inc. Band welding fixture. 4,192,055, Cl. 29-281.400.

Moran, Steven E., to United States of America, Navy. Optical heterodyne system for imaging in a dynamic diffusive medium. 4,193,088, Cl. 358-95.000.

Morelli, John A.: *See*—
Laudig, Ronald C.; and Morelli, John A., 4,192,566, Cl. 339-47.00R.

Morgan, Burton D., to Concept Development Institute, Inc. Inflatable building and anchor means for pipeline construction. 4,192,105, Cl. 52-2.000.

Morgan, John H. Highway vehicle splash and spray control shield. 4,192,522, Cl. 280-154.50R.

Mori, Keiichi: *See*—
Fushiki, Isamu; Kamitakahara, Atushi; and Mori, Keiichi, 4,192,680, Cl. 430-380.000.

Morigami, Eiji; and Inahara, Motoharu, to Iwasaki Tsushinki Kabushiki Kaisha. Remote-controllable automatic telephone answering device. 4,192,971, Cl. 179-6.00E.

Morikawa, Michio: *See*—
Hayashi, Torahiko; Maeda, Takashi; and Morikawa, Michio, 4,192,636, Cl. 425-96.000.

Morikawa, Teruo: *See*—
Tsunoi, Haruo; Morikawa, Teruo; Yamada, Katsuhiko; Ohkawara, Kenji; and Kubota, Atsushi, 4,192,229, Cl. 100-158.00R.

Morita, Toshiaki; Takatori, Hironari; Makino, Fusao; Yasuda, Syoichi; and Nishioka, Yoshiki, to Sharp Kabushiki Kaisha. OCR for reading a constraint free hand-written character or the like. 4,193,056, Cl. 340-146.3AC.

Moriya, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Read only memory. 4,193,125, Cl. 365-104.000.

Morrison, Clyde A.; Karayianis, Nick; and Wortman, Donald E., to United States of America, Army. Rare earth semiconductor laser. 4,193,044, Cl. 331-94.50F.

Morrison, Steven; Lisle, Thomas K., Jr.; and Glover, Clarence C., to United States of America, Air Force. Automatic bias adjustment circuit for a successive ranged analog/digital converter. 4,193,066, Cl. 340-347.0CC.

Mosby, William L.; and Hardy, William B., to American Cyanamid Company. Polymers stabilized with organo-phosphorus compounds. 4,192,796, Cl. 260-45.85S.

Moser, Theo, to Robert Bosch GmbH. Apparatus for filling capsules and the like. 4,192,361, Cl. 141-82.000.

Moskowitz, Larry N.; and Klar, Erhard, to SCM Corporation. Spray-and-fuse self-fluxing alloy powders. 4,192,672, Cl. 75-0.50C.

Motorola, Inc.: *See*—
Cerny, Frank J., Jr.; Helm, George D.; and Wesoloski, Ronald G., 4,193,036, Cl. 455-327.000.
Hilbert, Francis H.; and Parker, Norman W., 4,192,968, Cl. 179-1.0GS.
Kyu, Shikun, 4,193,037, Cl. 328-46.000.
Nash, Harold G.; and Linford, John R., 4,193,118, Cl. 364-734.000.
Wechsler, Reuben, 4,192,993, Cl. 235-92.0DE.

Mousseau, Timothy K.: *See*—
Stevens, John M.; Allen, Grant W.; Cole, John M.; and Mousseau, Timothy K., 4,192,992, Cl. 219-494.000.

Moyer, Laurence, to Cessna Aircraft Company, The. Cylinder locking ring. 4,192,225, Cl. 92-169.000.

Moyer, Richard D. Scooped boat hull having tri-keel surfaces. 4,192,248, Cl. 114-56.000.

MPL, Inc.: *See*—
Raghavachari, Srinivas T., 4,192,919, Cl. 435-292.000.

Mubarak, Scott J.: *See*—
Hargens, Alan R.; and Mubarak, Scott J., 4,192,319, Cl. 128-748.000.

Mucci, Peter E. R., to International Standard Electric Corporation. Underwater connector. 4,192,569, Cl. 339-96.000.

Muchnik, Simon V.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

Mueller, Karl F.; and Good, William R., to Ciba-Geigy Corporation. Water-insoluble hydrophilic copolymers. 4,192,827, Cl. 525-123.000.

Mueller, Kurt F.: *See*—
Farncomb, Robert E.; Mueller, Kurt F.; and Wagaman, Kerry L., 4,192,819, Cl. 260-583.00N.

Muether, Manfred; Phleps, Tilman; and Schmitt, Ernst, to Siemens Aktiengesellschaft. Dental x-ray diagnostic installation. 4,193,002, Cl. 250-479.000.

Mukerjee, Ambar: *See*—
Beck, Heinz; Frassek, Karl H.; Holtvoigt, Werner; and Mukerjee, Ambar, 4,192,930, Cl. 525-227.000.

Muller, Hanns P.: *See*—
Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., 4,192,936, Cl. 528-59.000.

Munch, Werner; and Mikusch, Gerald, to L. Schuler GmbH. Apparatus for driving a pair of gripper bars in a longitudinal direction. 4,192,169, Cl. 72-405.000.

Munchmeyer & Co.: *See*—
Gielnik, Harry, 4,192,040, Cl. 17-11.000.

Munker, Erich; Klein, Alfred; and Heitze, Gerhard, to Schloemann-Siemag Aktiengesellschaft. Transverse dividing shear for rolling-mill products, especially heavy plate. 4,192,208, Cl. 83-438.000.

Munnerlyn, Charles R.; and Clapham, Terrance N., to Ical, Incorporated. Indentation tonometer. 4,192,317, Cl. 128-646.000.

Murata Manufacturing Co., Ltd.: *See*—
Nakamura, Takeshi, 4,193,008, Cl. 310-321.000.

Murenbeeld, Karel: *See*—
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, 4,192,047, Cl. 28-220.000.

Murphy, Wesley T., to E.T.I. Corporation. Structural member. 4,192,119, Cl. 52-588.000.

Muto, Hakaru: *See*—
Kurahayashi, Sadasuke; Kato, Yuzo; Tsuda, Shin; Muto, Hakaru; and Watanabe, Asao, 4,193,097, Cl. 358-261.000.
Muto, Norio: *See*—
Tanasawa, Yasusi; Muto, Norio; and Saito, Akinori, 4,192,466, Cl. 239-464.000.
Myers, Casper E. Trailer hitch guiding device. 4,192,526, Cl. 280-477.000.
Nachtkamp, Klaus: *See*—
Noll, Klaus; Nachtkamp, Klaus; and Pedain, Josef, 4,192,937, Cl. 528-59.000.
Naf, Ferdinand, to Firmenich SA. Perfumed articles containing cis-oct-6-en-1-al. 4,192,781, Cl. 252-522.00R.
Nagai, Kazuyoshi. Process for fusion-bonding of resins. 4,192,700, Cl. 156-272.000.
Naganawa, Hiroshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.
Nagatani, Toshio: *See*—
Nishina, Yoshio; Matsuo, Syunji; Nagatani, Toshio; Takahashi, Kazuo; and Habu, Takeshi, 4,192,682, Cl. 430-405.000.
Nagatomo, Itsuyoshi: *See*—
Baba, Kohzo; and Nagatomo, Itsuyoshi, 4,192,673, Cl. 75-0.50C.
Nagel, Hartmut: *See*—
Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, 4,192,696, Cl. 148-101.000.
Nagumo, Shin-ichi: *See*—
Ohoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,192,262, Cl. 123-75.00B.
Nahta, Roop C., to GAF Corporation. Cationic dye carrier and selective process for dyeing polyesters. 4,192,648, Cl. 8-86.000.
Naito, Naoki, to Jujo Paper Co., Ltd. Paperboard liquid container. 4,192,446, Cl. 229-37.00R.
Naito, Tsutomu: *See*—
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumio; and Naito, Tsutomu, 4,192,733, Cl. 208-33.000.
Nakada, Akira: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,192,211, Cl. 84-1.010.
Nakagawa, Hiroaki: *See*—
Hashimoto, Isao; Nakagawa, Hiroaki; and Nambu, Hirohiko, 4,192,958, Cl. 568-763.000.
Nakagawa, Sumio; Tanaka, Toshio; and Todo, Kenji, to Hitachi, Ltd. Combustion control apparatus. 4,192,641, Cl. 431-15.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; Iwashita, Kanau; and Uchida, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Muffler for internal combustion engines. 4,192,402, Cl. 181-256.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, to Honda Giken Kogyo Kabushiki Kaisha. Muffler for internal combustion engines. 4,192,403, Cl. 181-268.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, to Honda Giken Kogyo Kabushiki Kaisha. Muffler for internal combustion engines. 4,192,404, Cl. 181-272.000.
Nakajima, Yasuo: *See*—
Ohoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,192,262, Cl. 123-75.00B.
Nakamura, Nobuhiro: *See*—
Hashimoto, Tsutomu; and Nakamura, Nobuhiro, 4,192,452, Cl. 235-471.000.
Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Tuning fork formed of rolled invariable elasticity material. 4,193,008, Cl. 310-321.000.
Nakamura, Yozo; and Ohshina, Morio, to Hitachi Construction Machinery Co., Ltd. Constant velocity universal joint. 4,192,154, Cl. 64-21.000.
Nakao, Kozaburo; and Miyajima, Toru, to Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho. Method and apparatus for regenerating used activated carbon. 4,192,962, Cl. 13-7.000.
Nakase, Takamichi: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,192,268, Cl. 123-119.0EC.
Nakazato, Kazuo: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.
Nambu, Hirohiko: *See*—
Hashimoto, Isao; Nakagawa, Hiroaki; and Nambu, Hirohiko, 4,192,958, Cl. 568-763.000.
Narayanan, Venkatachala L.: *See*—
Hauck, Frederic P.; Narayanan, Venkatachala L.; O'Connor, Jeremiah J.; and Pilote, Raymond R., 4,192,889, Cl. 424-309.000.
Nash, Harold G.; and Linford, John R., to Motorola, Inc. Low pass digital averaging filter. 4,193,118, Cl. 364-734.000.
Nashman, Alvin E.: *See*—
Rabow, Gerald; and Nashman, Alvin E., 4,193,030, Cl. 375-2.000.
National Petro Chemicals Corporation: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,192,775, Cl. 252-430.000.
National Research Development Corporation: *See*—
Hoult, David I.; and Styles, Peter, 4,193,024, Cl. 324-313.000.
National Semiconductor Corporation: *See*—
Tietz, Gary W., 4,193,007, Cl. 307-291.000.
National Starch and Chemical Corporation: *See*—
Micchelli, Albert L.; Nowak, Frank A., Jr.; and Ganslaw, Stuart H., 4,192,861, Cl. 424-47.000.
Nawata, Takanari: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,192,773, Cl. 252-429.00R.
Neisler, Henry P.: *See*—
Peeler, Burin A.; and Neisler, Henry P., 4,192,355, Cl. 139-435.000.
Nelson, Lawrence V.: *See*—
Pederson, Paul D., Jr.; Ufford, Keith A.; and Nelson, Lawrence V., 4,192,988, Cl. 219-201.000.
Nelson, Robert L., to Tracor, Inc. Pressure sensor. 4,192,191, Cl. 73-701.000.
Nercessian, Sarkis, to Kepco, Inc. Programmable overvoltage protector. 4,193,104, Cl. 361-56.000.
Nezu, Hisao, to Nippon Seiki Kabishiki Kaisha. Odometer. 4,192,450, Cl. 235-95.00R.
Nichol, John D.: *See*—
Haselgrove, Bob; and Nichol, John D., 4,192,242, Cl. 112-262.200.
Nicholas International Limited: *See*—
Suh, John T.; and Bare, Thomas M., 4,192,805, Cl. 260-340.50R.
Nicolau, Yves-Claude; and Gersonde, Klaus, to Studiengesellschaft Kohle mbH. Controlled improvement of the O2release by intact erythrocytes with lipid vesicles. 4,192,869, Cl. 424-199.000.
Nietupski, Val J., to Valco Corporation. Air tight fuel burning stove. 4,192,285, Cl. 126-83.000.
Nihon Sekiyu Hanbai Kabushiki Kaisha: *See*—
Tanaka, Seiyo, 4,192,145, Cl. 60-675.000.
Nihon-Yohin Co., Ltd.: *See*—
Sato, Tomoyoshi, 4,192,333, Cl. 135-3.00E.
Nikka Kabushiki Kaisha: *See*—
Kawakami, Yoshito, 4,192,231, Cl. 101-425.000.
NIKO Konserven-Maschinenfabrik Hinsbek GmbH & Co., KG: *See*—
Thonissen, Willi, 4,192,416, Cl. 198-433.000.
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, to Stiftelsen for Metallurgisk Forskning. Lance for injecting powdery material into molten metal. 4,192,490, Cl. 266-225.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,192,211, Cl. 84-1.010.
Yamaga, Eiichi; Aoki, Eiichiro; and Imamura, Akio, 4,192,212, Cl. 84-1.030.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Hiroshi; Ito, Yoshiaki; Tokonami, Hiroshi; and Sawada, Atsuo, 4,192,649, Cl. 8-138.000.
Nippon Kogaku K.K.: *See*—
Furuya, Mikihito, 4,192,599, Cl. 354-173.000.
Sato, Akihiko; and Araki, Yoshitaka, 4,192,598, Cl. 354-153.000.
Nippon Seiki Kabishiki Kaisha: *See*—
Nezu, Hisao, 4,192,450, Cl. 235-95.00R.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,192,268, Cl. 123-119.0EC.
Nippon Steel Corporation: *See*—
Matsuo, Masataka, 4,192,460, Cl. 239-79.000.
Ueda, Yuziro; Yoshida, Toru; and Honda, Michiyasu, 4,192,486, Cl. 266-44.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Houkawa, Kouji; Yamauchi, Yoshiki; and Yoshikawa, Shokichiro, 4,193,045, Cl. 331-107.00A.
Nippondenso Co., Ltd.: *See*—
Kazino, Sadayosi; and Doi, Tatsuo, 4,192,195, Cl. 74-7.00A.
Nishina, Yoshio; Matsuo, Syunji; Nagatani, Toshio; Takahashi, Kazuo; and Habu, Takeshi, to Konishiroku Photo Industry Co., Ltd. Process of forming a high-contrast silver image. 4,192,682, Cl. 430-405.000.
Nishioka, Yoshiki: *See*—
Morita, Toshiaki; Takatori, Hironari; Makino, Fusao; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,193,056, Cl. 340-146.3AC.
Nissan Motor Company, Limited: *See*—
Iizuka, Haruhiko; Sugasawa, Fukashi; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,192,278, Cl. 123-198.00F.
Ohoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,192,262, Cl. 123-75.00B.
Tanaka, Shigenori; Tojo, Akio; Ohnishi, Kimimasa; and Kikuchi, Takeshi, 4,192,357, Cl. 139-450.000.
Nixon, Ralph D., to English Electric Valve Company Limited. Display arrangements. 4,193,014, Cl. 313-396.000.
Noblanc, Alain G. N.: *See*—
Michel, Dominique; and Noblanc, Alain G. N., 4,192,110, Cl. 52-111.000.
Nogami, Tomoyuki: *See*—
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,192,345, Cl. 137-572.000.
Nolan, John P. S., to Skemmill Limited. Coiling machine. 4,192,126, Cl. 57-3.000.
Noll, Klaus; Nachtkamp, Klaus; and Pedain, Josef, to Bayer Aktiengesellschaft. Process for the preparation of isocyanate polyaddition products which have hydroxyl groups in side chains. 4,192,937, Cl. 528-59.000.
Nonoyama, Takao; and Yasuda, Takeru, to Toyota Jidosha Kegko Kabushiki Kaisha. Exhaust gas purifying system for engines. 4,192,141, Cl. 60-290.000.

Normand Trust: *See*—
Mercier, Jacques H., 4,192,350, Cl. 138-30.000.
Norris, Philip R., to Polaroid Corporation. Photographic film assemblage. 4,192,593, Cl. 354-86.000.
Northrop Corporation: *See*—
Byers, Leroy R., 4,192,476, Cl. 244-83.00K.
Nose, Takashi: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.
Nowak, Frank A., Jr.: *See*—
Micchelli, Albert L.; Nowak, Frank A., Jr.; and Ganslaw, Stuart H., 4,192,861, Cl. 424-47.000.
Numakura, Toshihiko: *See*—
Yamagiwa, Kazuo; Saito, Kaneo; and Numakura, Toshihiko, 4,193,084, Cl. 358-4.000.
Nyhus, Orville K., to Rockwell International Corporation. Balun transformer. 4,193,048, Cl. 333-26.000.
O.G. Hoyer A/S: *See*—
Krener, Ole G.; and Waldstrom, Ejvind, 4,192,415, Cl. 198-374.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Schwappach, Dieter, 4,192,089, Cl. 37-142.00A.
Occidental Oil Shale, Inc.: *See*—
Cha, Chang Y., 4,192,381, Cl. 166-261.000.
Ricketts, Thomas E., 4,192,554, Cl. 299-2.000.
Studebaker, Irving G.; and Hefelfinger, Richard, 4,192,553, Cl. 299-2.000.
O'Connor, Jeremiah J.: *See*—
Hauck, Frederic P.; Narayanan, Venkatachala L.; O'Connor, Jeremiah J.; and Pilote, Raymond R., 4,192,889, Cl. 424-309.000.
Ogami, Noboru. Forceps designed to facilitate insertion of a laminaria tent into the uterine cervix. 4,192,313, Cl. 128-321.000.
Ogata, Shunji; and Yamamoto, Yohei, to Japan Oxygen Co., Ltd.; and Tokyo Cryogenic Industries Co., Ltd. Process for liquefying and rectifying air. 4,192,662, Cl. 62-13.000.
Ogawa, Tsuneshi: *See*—
Godai, Tomokazu; Sugiyama, Tohru; Sugino, Morihiko; Kondo, Masaru; and Ogawa, Tsuneshi, 4,192,175, Cl. 73-19.000.
Ogino, Shuji, to Minolta Camera Kabushiki Kaisha. Zoom lens system. 4,192,577, Cl. 350-184.000.
Ogiso, Akira: *See*—
Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, 4,192,953, Cl. 568-673.000.
Oglesbee, Richard K., to Anchor Hocking Corporation. Cushioning pads for cartons. 4,192,421, Cl. 206-426.000.
Ohashi, Fumio: *See*—
Onodera, Takashi; Komine, Kikuji; and Ohashi, Fumio, 4,192,732, Cl. 208-33.000.
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumio; and Naito, Tsutomu, 4,192,733, Cl. 208-33.000.
Ohkawara, Kenji: *See*—
Tsunoi, Haruo; Morikawa, Teruo; Yamada, Katsuhiko; Ohkawara, Kenji; and Kubota, Atsushi, 4,192,229, Cl. 100-158.00R.
Ohmi, Atsushi: *See*—
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,192,345, Cl. 137-572.000.
Ohmura, Kasutaka: *See*—
Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, 4,192,901, Cl. 426-580.000.
Ohnishi, Kimimasa: *See*—
Tanaka, Shigenori; Tojo, Akio; Ohnishi, Kimimasa; and Kikuchi, Takeshi, 4,192,357, Cl. 139-450.000.
Ohno, Tasuku, to Stiron Chemical Industry Co. Ltd. Sound reproducing mechanism for toys. 4,192,514, Cl. 274-1.00A.
Ohoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, to Nissan Motor Company, Limited. Control system for varying the amount of scavenging air to be admitted to internal combustion engine. 4,192,262, Cl. 123-75.00B.
Ohshina, Morio: *See*—
Nakamura, Yozo; and Ohshina, Morio, 4,192,154, Cl. 64-21.000.
Ohta, Takaaki: *See*—
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,192,345, Cl. 137-572.000.
Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, to Fuji Photo Film Co., Ltd. Camera film processor. 4,192,594, Cl. 354-90.000.
Okahashi, Kazuo: *See*—
Shibayama, Kyoichi; Okahashi, Kazuo; and Hayashi, Osamu, 4,192,786, Cl. 260-18.0EP.
Okamura, Hiromasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary master cylinder means. 4,192,224, Cl. 92-125.000.
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, to Ricoh Co., Ltd. 1,3,4-Oxadiazole derivatives and use thereof. 4,192,677, Cl. 430-77.000.
Okazaki, Sakiho: *See*—
Hosokawa, Minoru; Ishii, Hiroshi; Kawamura, Yoshikazu; and Okazaki, Sakiho, 4,192,131, Cl. 368-157.000.
Oki, Toshikazu: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.
O'Konski, George J.: *See*—
Beuch, Wallace E.; O'Konski, George J.; Rusch, Kenneth D.; and Wytaski, Thomas A., 4,193,102, Cl. 360-105.000.
Okumura, Takatoshi: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,192,211, Cl. 84-1.010.
O'Leary, Kevin J.: *See*—
Dotson, Ronald L.; and O'Leary, Kevin J., 4,192,725, Cl. 204-98.000.
Oliff, James R., to Mead Corporation, The. Article carrier blank. 4,192,540, Cl. 294-87.200.
Olsen, Kolbjorn, to Kokvik, Bjorn. Light fixtures. 4,193,110, Cl. 362-371.000.
Olympus Optical Company Limited: *See*—
Hyakumura, Kazushi, 4,192,579, Cl. 350-227.000.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Derivatives of thiazolidinecarboxylic acids and related acids. 4,192,878, Cl. 424-270.000.
Ondetti, Miguel A.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Carboxyalkylacyl substituted imidazolylamino acids. 4,192,881, Cl. 424-273.00R.
Ondetti, Miguel A.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Carboxyalkylacylamino acids. 4,192,882, Cl. 424-274.000.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Process for preparing proline and homoproline derivatives. 4,192,945, Cl. 546-245.000.
O'Neil, John B.; and Dewhirst, William, to Exxon Research & Engineering Co. Method and apparatus for making monofilament twines. 4,192,127, Cl. 57-7.000.
Onodera, Takashi; Komine, Kikuji; and Ohashi, Fumio, to Toa Nenryo Kogyo Kabushiki Kaisha. Recovery and recycle of dewaxing aid. 4,192,732, Cl. 208-33.000.
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumio; and Naito, Tsutomu, to Toa Nenryo Kogyo Kabushiki Kaisha. Solvent dewaxing waxy hydrocarbon oils using dewaxing aid. 4,192,733, Cl. 208-33.000.
Ontario Research Foundation: *See*—
Glass, Roger W.; and Kuntze, Richard A., 4,192,707, Cl. 162-3.000.
Oppel, Werner, to Klockner Ionon GmbH. Method and arrangement for controlling the electrical relationships of a current-intensive glow discharge. 4,193,070, Cl. 340-650.000.
Optical Coating Laboratory, Inc.: *See*—
Anthon, Erik W., 4,192,995, Cl. 250-338.000.
Orban, Jean, to Vivitar Corporation. Electronic system for photographic devices. 4,192,586, Cl. 354-24.000.
Ordynsky, Georgy V.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.
O'Riordan, Sean S. Atomic model. 4,192,084, Cl. 35-18.00A.
Ormrod, Derek T.: *See*—
Hayden, Owen; Sheward, George E.; Ormrod, Derek T.; Willby, Christopher R.; and Firth, George F., 4,192,374, Cl. 165-158.000.
Osborn, Claiborn L., to Union Carbide Corporation. Radiation curable urethane compositions. 4,192,762, Cl. 252-182.000.
Oseas, Jonathan: *See*—
Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., 4,193,131, Cl. 375-2.000.
Osipov, Vitaly G.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.
Ostbo, Nils. Air preheating means at a vertical steam or hot water boiler. 4,192,260, Cl. 122-182.00R.
Oswald, Alexis A.; and Valint, Paul L., Jr., to Exxon Research & Engineering Co. Unsymmetrical O-alkyl S'-butyl S-alkylthioalkyl dithiophosphates and oxidized derivatives thereof. 4,192,829, Cl. 260-948.000.
Ott, Anton: *See*—
Hamma, Karlmann; and Ott, Anton, 4,192,199, Cl. 74-687.000.
Ott, Paul W.: *See*—
Van Steenwyk, Donald H.; Cash, John R.; and Ott, Paul W., 4,192,077, Cl. 33-313.000.
Otteson, Jack O.; and Martin, Eugene J., to Dana Corporation. Safety vacuum valve and electric switch for speed control systems. 4,192,399, Cl. 180-170.000.
Owen, Geoffrey R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,192,879, Cl. 424-273.00R.
Owen, Robert. Wraparound weighted exercise device for the foot and ankle. 4,192,502, Cl. 272-119.000.
Owens-Corning Fiberglas Corporation: *See*—
Chrisman, Max G., 4,192,667, Cl. 65-374.0RM.
McCort, Ralph E., 4,192,516, Cl. 277-12.000.
Paul, Francis R., 4,192,252, Cl. 118-258.000.
Schmandt, Gary M.; Chappelear, Robert N.; and Hand, Ronnie D., 4,192,663, Cl. 65-11.00R.
Owens-Illinois, Inc.: *See*—
Babcock, Clarence L.; Busdiecker, Robert A.; and Hagedorn, Erwin C., 4,192,688, Cl. 106-39.700.
Ownby, James C.: *See*—
Wang, Richard H. S.; Irick, Gether, Jr.; and Ownby, James C., 4,192,794, Cl. 260-42.450.

Oya, Akiyoshi: *See*—
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,192,211, Cl. 84-1.010.

Oya, Hiroo; and Tatejima, Masakazu, to Fuji Jukogyo Kabushiki Kaisha. Exhaust gas purification system for internal combustion engines. 4,192,846, Cl. 422-168.000.

P-W Industries, Inc.: *See*—
Urbanski, Edward F., 4,192,209, Cl. 83-564.000.

Pacella, Samuel S. Flexible conduit connector. 4,192,532, Cl. 285-248.000.

Pacific Scientific Company: *See*—
Ay, Leo E.; and Arriaza, Ramon E., 4,192,173, Cl. 73-11.000.

Pack, Jerome E.: *See*—
Austermann, John F., Jr.; and Pack, Jerome E., 4,192,396, Cl. 180-252.000.

Pagel, Ernst-Olav, to Robert Bosch GmbH. Condition responsive inductance to frequency converter with temperature compensation. 4,193,041, Cl. 331-65.000.

Pammenter, Robert V.; and Haigh, Curzon J., to Electrolytic Zinc Co. of Australasia Limited. Process for precipitating iron as jarosite with a low non-ferrous metal content. 4,192,852, Cl. 423-42.000.

Pangborn, Jon B.; and Dafler, James R., to Gas Research Institute. Thermoelectrochemical process using copper sulfate for producing hydrogen and oxygen from water. 4,192,726, Cl. 204-129.000.

Paoletti, Alfred J., to Cabot Corporation. Methods of hard facing. 4,192,983, Cl. 219-76.100.

Par-Way Mfg Co.: *See*—
Hanson, Harold W., Sr., 4,192,898, Cl. 426-250.000.

Paraskevas, Dimitri, to Centre Technique des Industries Mecaniques. Method and device for the measurement of photoelasticity. 4,192,610, Cl. 356-33.000.

Paret, Jacques, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Process for constituting a large surface of natural tobacco, in particular for making cigar wrappers. 4,192,324, Cl 131-149.000.

Parfinenko, Ivan V.: *See*—
Vasilevsky, Petr N.; Gekhman, Boris S.; Parfinenko, Ivan V.; Podgursky, Alfred M.; and Lazaretnik, Avram S., 4,192,294, Cl. 128-1.00R.

Parker, Ernest G.: *See*—
Hirsch, Horst E.; Higginson, John F.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,192,851, Cl. 423-28.000.

Parker, Norman W.: *See*—
Hilbert, Francis H.; and Parker, Norman W., 4,192,968, Cl. 179-1.0GS.

Parker, Roger A., to Richardson-Merrell Inc. Antirhinovirus agents. 4,192,895, Cl. 424-331.000.

Parker, William D.; Smith, Harry M.; and Edwards, Margaret P., to Winn & Coales (Denso) Limited. Hot applied coatings. 4,192,697, Cl. 156-188.000.

Parkinson, David B.; and Parkinson, Truman D., to Gould Inc. Method of manufacturing battery plates. 4,192,049, Cl. 29-2.000.

Parkinson, Truman D.: *See*—
Parkinson, David B.; and Parkinson, Truman D., 4,192,049, Cl. 29-2.000.

Parthoens, Pierre A.: *See*—
Richard, Andre J.; Delmotte, Philippe M.; and Parthoens, Pierre A., 4,192,120, Cl. 52-741.000.

Pastukhov, Valery V.: *See*—
Vydrin, Vladimir N.; Barkov, Leonid A.; Pastukhov, Valery V.; Dolgov, Sergei I.; and Sysoev, Vladimir S., 4,192,165, Cl. 72-238.000.

Patak, Richard J.: *See*—
Rains, Lyle V.; Bristow, Stephen D.; and Patak, Richard J., 4,192,507, Cl. 273-311.000.

Patenaude, James K., to Wilderness Mold, Inc. Dust shroud. 4,192,104, Cl. 51-273.000.

Patrick, John P.: *See*—
Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,193,005, Cl. 290-44.000.

Patterson, Lewis K. Telescoping extension for vehicles. 4,192,544, Cl. 296-165.000.

Patton, Franklin D.; and McFarlane, James D., to Westbay Instruments Ltd. Casing assembly probes. 4,192,181, Cl. 73-155.000.

Paul, Francis R., to Owens-Corning Fiberglas Corporation. Apparatus for applying liquid to continuously advancing filaments. 4,192,252, Cl. 118-258.000.

Paul, John M., to Budd Company, The. Series pneumatic and coil spring railway car suspension. 4,192,239, Cl. 105-199.00R.

Paust, Joachim; and Schumacher, Horst, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Methyl fumaraldehyde monoacetals and process. 4,192,806, Cl. 260-340.700.

Pavlica, Robert T.; Stein, Thomas R.; and Streed, Carl W., to Mobil Oil Corporation. Production of high quality fuel oils. 4,192,734, Cl. 208-80.000.

Pavone, Carlo: *See*—
Avellis, Cosmo L.; Pavone, Carlo; and Wolfkamp, Albertus, 4,192,183, Cl. 73-182.000.

Peck, Alan M.: *See*—
Reedman, David C.; Shutt, Joseph A.; and Peck, Alan M., 4,192,033, Cl. 12-10.100.

Pedain, Josef: *See*—
Noll, Klaus; Nachtkamp, Klaus; and Pedain, Josef, 4,192,937, Cl. 528-59.000.

Pederson, Paul D., Jr.; Ufford, Keith A.; and Nelson, Lawrence V., to Foto-Mark, Inc. Electrically heated thermal microbial drain barrier. 4,192,988, Cl. 219-201.000.

Peeler, Burin A.; and Neisler, Henry P., to Dicey Fabrics, Inc. Apparatus for looms having fluid operated yarn insertion means. 4,192,355, Cl. 139-435.000.

Peletz, Harold. Precast concrete catch basin with form for gutter inlet. 4,192,625, Cl. 404-5.000.

Peltre, Philippe; and Lafleur, Alain, to Procter & Gamble Company, The. Detergent compositions containing a suds regulating system. 4,192,761, Cl. 252-99.000.

Pendleton, Robert G.: *See*—
Bondinell, William E.; and Pendleton, Robert G., 4,192,888, Cl. 424-321.000.

Pengilly, Roger W., to Lever Brothers Company. Hairspray containing a hairspray resin and a drag reducing agent. 4,192,862, Cl. 424-47.000.

Penick, Ib, to Camera Plus, Inc. Camera with improved shutter arrangement. 4,192,596, Cl. 354-142.000.

Peoples, John R. Electric jump rope. 4,192,501, Cl. 272-75.000.

Pepsico, Inc.: *See*—
Tabickman, Maurice L.; and Dempsey, Douglas E., 4,192,505, Cl. 273-73.00C.

Perkin-Elmer Corporation, The: *See*—
deMey, Charles F., II; and Helms, Charles C., 4,192,614, Cl. 356-410.000.

Perun, William D.; and Amatangelo, Paul C., to Xerox Corporation. Composition for the surface of sheet separating devices. 4,192,497, Cl. 271-18.000.

Peters, Klaus-Jurgen; Wissmann, Michael; and Schelhas, Peter, to Robert Bosch GmbH. Regulating apparatus for a fuel supply system for a mixture-compressing, externally ignited internal combustion engine. 4,192,271, Cl. 123-139.0AW.

Peters, Leo; and Klemm, Richard O. Oven for cooking meat roasts. 4,192,991, Cl. 219-413.000.

Petersen, John F. Weeelchair tilt cradle. 4,192,549, Cl. 297-464.000.

Petrocci, Alfonso N.: *See*—
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,192,817, Cl. 260-513.00N.

Petry, Stanton H., to Cory Food Services, Inc. Beverage brewer. 4,192,227, Cl. 99-279.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Shuttle sensing means for weaving machine catcher mechanism. 4,192,354, Cl. 139-342.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Catcher mechanism in a gripper projectile weaving machine and method of operating same. 4,192,356, Cl. 139-439.000.

Pfleiderer, Hans J.: *See*—
Knauer, Karl; and Pfleiderer, Hans J., 4,193,050, Cl. 333-165.000.

Philipp, Heinz: *See*—
Hunke, Friedrich; and Philipp, Heinz, 4,192,635, Cl. 425-71.000.

Philippe, Andre: *See*—
Tellier, Jacques; Philippe, Andre; Mathieu, Pierre; and Voirin, Robert, 4,192,857, Cl. 423-576.000.

Phillipps, Gordon H.; May, Peter J.; and Ayres, Barry E., to Glaxo Laboratories Limited. Chemical compounds. 4,192,871, Cl. 424-241.000.

Phillips, Clarence A. L.; and Archer, Henry W., to Texaco Trinidad, Inc.; and Texaco Development Corporation. Desiccant and defoliating spray composition for leguminous plants. 4,192,668, Cl. 71-70.000.

Phillips Petroleum Company: *See*—
Chapman, Charles C., 4,192,825, Cl. 585-719.000.
Smith, Ernest L., 4,192,440, Cl. 222-528.000.
Wu, Yulin, 4,192,810, Cl. 260-348.160.

Phleps, Tilman: *See*—
Muether, Manfred; Phleps, Tilman; and Schmitt, Ernst, 4,193,002, Cl. 250-479.000.

Picard, Jacques. Locking mechanism. 4,192,535, Cl. 292-37.000.

Pichler, Alfred: *See*—
Berghof, Winfried; and Pichler, Alfred, 4,192,985, Cl. 219-121.0EM.

Picker Corporation: *See*—
Brougham, Robert W.; and Mitchell, Paul, 4,193,089, Cl. 358-111.000.

Pierce, Bill L., to Westinghouse Electric Corp. Direct contact heat exchanger with phase change of working fluid. 4,192,144, Cl. 60-641.000.

Pierce, Leo P., to Feecon Corporation. Fire fighting apparatus. 4,192,385, Cl. 169-56.000.

Pierre Fabre, S.A.: *See*—
Cousse, Henri; Bonnaud, Bernard; Tarayre, Jean-Pierre; and Casadio, Silvano, 4,192,883, Cl. 424-274.000.

Pierson, Darrell E.: *See*—
Brookhyser, Byron B.; and Pierson, Darrell E., 4,192,079, Cl. 34-13.800.

Pietruck, Horst: *See*—
Gerigk, Gunter; Klendauer, Wolfgang; Pietruck, Horst; and Hammer, Klaus-Dieter, 4,192,904, Cl. 428-36.000.

Pilote, Raymond R.: *See*—
Hauck, Frederic P.; Narayanan, Venkatachala L.; O'Connor, Jeremiah J.; and Pilote, Raymond R., 4,192,889, Cl. 424-309.000.

Pinnock, Jay L.; and Staten, Ivan C. Fireplace liner. 4,192,458, Cl. 237-51.000.

Pippin, Roy L. Container filling apparatus and method. 4,192,359, Cl. 141-12.000.

Pitney-Bowes, Inc.: *See*—
Toto, John A., 4,192,498, Cl. 271-21.000.

Pittsburgh Corning Corporation: *See*—
Joshi, Shridhar B., 4,192,664, Cl. 65-22.000.

Platt, John R.; and Weaver, William N., to Illinois Tool Works Inc. Plant container for growing plants which are to be transplanted. 4,192,096, Cl. 47-73.000.

Plessey Handel und Investments AG: *See*—
Williams, Roger M.; and Lawrence, Alan J., 4,192,973, Cl. 370-53.000.

Pobortsev, Mendel E.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.

Poderschan, Karl J.: *See*—
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, 4,192,490, Cl. 266-225.000.

Podgursky, Alfred M.: *See*—
Vasilevsky, Petr N.; Gekhman, Boris S.; Parfinenko, Ivan V.; Podgursky, Alfred M.; and Lazaretnik, Avram S., 4,192,294, Cl. 128-1.00R.

Podiak, Richard S.; Houghton, LeRoy H.; and Rempes, Paul E., Jr., to Champion Spark Plug Company. Spark plug seal. 4,193,012, Cl. 313-137.000.

Poirier, Daniel, to Automobiles Peugeot. Gearbox comprising means for braking the input shaft for engaging a non-synchronized speed. 4,192,410, Cl. 192-4.00A.

Polaroid Corporation: *See*—
LaRocque, Arthur G.; Whiteside, George D.; and Johnson, Bruce K., 4,192,587, Cl. 354-27.000.
Norris, Philip R., 4,192,593, Cl. 354-86.000.
Ting, Lawrence K. M., 4,192,597, Cl. 354-145.000.
Yobaccio, Edward A., 4,192,591, Cl. 354-62.000.

Pollehn, Herbert K.; and Bratton, Jerry L., to United States of America, Army. Thin antireflection coating for electro-optical device. 4,193,011, Cl. 313-94.000.

Polyakov, Sergei A.; Shapiro, Aron L.; and Gankin, Viktor J. Method and catalyst for preparing styrene. 4,192,961, Cl. 585-319.000.

Polylok Corporation: *See*—
Duhl, Daniel; and Wall, Denton B., 4,192,160, Cl. 66-207.000.

Polysius AG: *See*—
Krutzner, Karl, Jr., 4,192,643, Cl. 432-106.000.

Porth, Erwin, to "Wilhelmstal" Ernst & Sohn GmbH & Co. KG. Self-sealing closure for mailing bags. 4,192,448, Cl. 229-80.000.

Portland-Zementwerke Heidelberg A.G.: *See*—
Meyer, Adolf; and Gutfleisch, Peter O., 4,192,690, Cl. 106-99.000.

Post, Hendrik W.: *See*—
Graser, Reinhold; Lendle, Wilhelm; and Post, Hendrik W., 4,192,821, Cl. 260-652.00P.

Post Office: *See*—
Fedida, Samuel; and Sargent, Desmond J., 4,193,121, Cl. 364-900.000.

Poulsen, Boyd J., to Syntex Puerto Rico, Inc. Inhalation device with capsule opener. 4,192,309, Cl. 128-203.150.

Poweray Infrared Corp.: *See*—
Heller, Anton H., 4,192,288, Cl. 126-343.50A.

Powers, John R., to Texaco Inc. Triple seal bubble cap assembly with kidney shaped inner tubular sleeve for a gas and liquid contact apparatus. 4,192,835, Cl. 261-114.00A.

PPG Industries Canada Ltd.: *See*—
Willett, Boyd R., 4,192,555, Cl. 299-4.000.

PPG Industries, Inc.: *See*—
Lupoi, Vincent, 4,192,666, Cl. 65-33.000.
Rideout, Walker H.; and Mansell, John D., 4,192,823, Cl. 260-658.00R.
Rinehart, Dale W., 4,192,689, Cl. 106-52.000.

Prentice, Paul N.: *See*—
Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., 4,193,131, Cl. 375-2.000.

Presley, Rex W., to Bendix Corporation, The. Rate sensor. 4,192,189, Cl. 73-505.000.

Price, Raymond; and Hall, Nigel, to Imperial Chemical Industries Limited. Process for the manufacture of aromatic nitriles. 4,192,800, Cl. 260-205.000.

Primary Design Group, Inc.: *See*—
Kotyuk, Bernard, 4,192,422, Cl. 206-528.000.

Procter & Gamble Company, The: *See*—
Peltre, Philippe; and Lafleur, Alain, 4,192,761, Cl. 252-99.000.

Produits Chimiques Ugine Kuhlmann Service Propriete Industrielle: *See*—
Alicot, Michel J. C.; Rhode, Rene H. P.; and Tignol, Adrien P. N., 4,192,804, Cl. 548-177.000.

Prospa N.V.: *See*—
Bruzzese, Tiberio; and Ferrari, Lorenzo, 4,192,864, Cl. 424-122.000.

Prucha, Martin J.; Donaldson, Willis L.; and Travers, Douglas N., to United States of America, Air Force. Teletype mixer apparatus for coding and decoding. 4,192,967, Cl. 178-22.000.

Pungs, Harmut: *See*—
Krismer, Bruno; and Pungs, Harmut, 4,192,674, Cl. 75-10.00R.

Purdue Research Foundation: *See*—
Cooper, George R., 4,193,031, Cl. 455-38.000.

Pye, David S.; Gallus, Julius P.; and Fischer, Paul W., to Union Oil Company of California. Well completion and workover fluid having low fluid loss. 4,192,753, Cl. 252-8.50A.

Pyreflex Corporation: *See*—
Berg, Charles A., 4,192,646, Cl. 432-239.000.

Quinn, James R. Fluid level and visual inspection device. 4,192,186, Cl. 73-303.000.

Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., to Chekhovsky Zavod Energeticheskogo Mashinostroenia. Device for effecting electroslag remelting processes. 4,192,370, Cl. 164-252.000.

Rabow, Gerald; and Nashman, Alvin E., to International Telephone and Telegraph Corporation. Frequency hopping communication system. 4,193,030, Cl. 375-2.000.

Racal-Milgo, Inc.: *See*—
Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., 4,193,112, Cl. 364-200.000.

Raghavachari, Srinivas T., to MPL, Inc. Blood sampling and culturing kit. 4,192,919, Cl. 435-292.000.

Raines, Russell H.: *See*—
Kuryla, William C.; and Raines, Russell H., 4,192,647, Cl. 8-62.000.

Rains, Lyle V.; Bristow, Stephen D.; and Patak, Richard J., to Atari, Inc. Light actuated shooting arcade game. 4,192,507, Cl. 273-311.000.

Raman, Rune E. B., to Boeing Commercial Airplane Company. Single impact rivet gun. 4,192,389, Cl. 173-15.000.

Rao, Bhaskara M. L., to Exxon Research & Engineering Co. Cells having cathodes with thiocyanogen-containing cathode-active materials. 4,192,912, Cl. 429-105.000.

Rapp, Guenther; Thomas, Erwin; Wolf, Dieter; Kuerten, Heribert; and Zehner, Peter, to BASF Aktiengesellschaft. Manufacture of hydroxylammonium salts. 4,192,856, Cl. 423-387.000.

Rasmussen, Hans C.; and Hallgreen, Knud J., to Danfoss A/S. Apparatus for controlling the supply temperature in a central heating installation. 4,192,455, Cl. 237-8.00R.

Rassieur, Charles L.; and Hesskamp, Richard R., to Central Mine Equipment Company. Drill rig hoist. 4,192,485, Cl. 254-187.500.

Rawlings, Dennis G., to Automotive Products Limited. Driven plates for friction clutches. 4,192,413, Cl. 192-106.200.

Ray Goebel & Sons, Inc.: *See*—
Goebel, Larry W., 4,192,388, Cl. 172-463.000.

Raywall Kommanditbolag: *See*—
Ekstrom, Lars A., 4,192,111, Cl. 52-171.000.

RCA Corporation: *See*—
Dietz, Wolfgang F. W., 4,193,018, Cl. 315-408.000.

Rea, Irvin B.: *See*—
Slavin, Michael; and Rea, Irvin B., 4,193,060, Cl. 340-52.00D.

Rebbeck, William G. Three-dimensional land-use planning model. 4,192,083, Cl. 35-16.000.

Redactron Corporation: *See*—
Lau, Edward H., 4,192,619, Cl. 400-163.000.

Redemann, Richard: *See*—
Beckman, Klaus; and Redemann, Richard, 4,192,471, Cl. 241-185.00R.

Reed and Barton Corporation: *See*—
Johnson, Robert M., 4,192,166, Cl. 72-347.000.

Reed, Donald K.; and Reed, Shere R. Apparatus for quilting layered fabrics. 4,192,241, Cl. 112-117.000.

Reed, Shere R.: *See*—
Reed, Donald K.; and Reed, Shere R., 4,192,241, Cl. 112-117.000.

Reedman, David C.; Shutt, Joseph A.; and Peck, Alan M., to USM Corporation. Shoe upper conforming machines. 4,192,033, Cl. 12-10.100.

Rees, David M.: *See*—
Burbidge, Bernard W.; and Rees, David M., 4,192,771, Cl. 252-415.000.

Reese, Max G.; and Hales, Richard H., to Becton, Dickinson and Company. Production of radioiodinated T_3 and T_4. 4,192,858, Cl. 424-1.000.

Regie Nationale des Usines Renault: *See*—
Arnaud, Henry, 4,192,264, Cl. 123-119.00A.

Reibetanz, Wilbert: *See*—
Wanner, Karl; and Reibetanz, Wilbert, 4,192,390, Cl. 173-75.000.

Reilly, Robert M., Sr. Pliable awning system. 4,192,112, Cl. 52-222.000.

Reiner, Roland: *See*—
Deibig, Heinrich; Heide, Helmut; Reiner, Roland; and Koster, Kari, 4,192,021, Cl. 3-1.900.

Reininghaus, Ulrich: *See*—
Friebe, Herbert, deceased; Rodert, Axel, administrator; and Reininghaus, Ulrich, 4,192,479, Cl. 248-354.00H.

Reinitz, Clayton W., to General Electric Company. Process for the recovery of 2,2-bis(4-hydroxyphenyl) propane. 4,192,955, Cl. 568-724.000.

Reis, Robert D., to United Electric Controls Company. Air flow transducer. 4,193,054, Cl. 338-42.000.

Reiss, James M.: *See*—
Foster, Edward H.; and Reiss, James M., 4,192,438, Cl. 222-5.000.

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 4,192,775, Cl. 252-430.000.

Rekow, Vernon C., to Champion International Corporation. Corner pad. 4,192,423, Cl. 206-586.000.

Rempes, Paul E., Jr.: *See*—
Podiak, Richard S.; Houghton, LeRoy H.; and Rempes, Paul E., Jr., 4,193,012, Cl. 313-137.000.

Renoth, Josef: *See—*
Jungwirth, Dieter; Renoth, Josef; and Wlodkowski, Johann, 4,192,114, Cl. 52-230.000.
Repla Limited: *See—*
Bucci, Carlo G., 4,192,624, Cl. 403-295.000.
Replogle, Douglas L., to Moog Inc. Pivot clip for a ski binding. 4,192,527, Cl. 280-618.000.
Resneau, Jean-Claude: *See—*
Henry, Raymond; Resneau, Jean-Claude; and Bouvet, Jean-Victor, 4,192,574, Cl. 350-96.170.
Rettig, Peter P.: *See—*
Mersek, Leo D.; and Rettig, Peter P., 4,192,172, Cl. 72-420.000.
Reynolds, Elmo M.: *See—*
Reynolds, Robert H.; and Reynolds, Elmo M., 4,192,125, Cl. 56-328.00R.
Reynolds, James E.; Hazen, Wayne C.; and Goens, Duane N., to Cyprus Metallurgical Processes Corporation. High temperature reduction of copper salts. 4,192,676, Cl. 75-72.000.
Reynolds Metals Company: *See—*
Schardein, Daniel J.; Rogers, Charles M.; and Vice, Diane N., 4,192,722, Cl. 204-38.00B.
Reynolds, Robert H.; and Reynolds, Elmo M. Reciprocating fruit harvester. 4,192,125, Cl. 56-328.00R.
Rheem Manufacturing Company: *See—*
Trieschock, George E.; and Dunbeker, George H., 4,192,843, Cl. 264-528.000.
Rheon Automatic Machinery Co., Ltd.: *See—*
Hayashi, Torahiko; Maeda, Takashi; and Morikawa, Michio, 4,192,636, Cl. 425-96.000.
Rhode, Rene H. P.: *See—*
Alicot, Michel J. C.; Rhode, Rene H. P.; and Tignol, Adrien P. N., 4,192,804, Cl. 548-177.000.
Ribka, Joachim: *See—*
Bauer, Wolfgang; and Ribka, Joachim, 4,192,947, Cl. 548-334.000.
Richard, Andre J.; Delmotte, Philippe M.; and Parthoens, Pierre A., to Entreprises de Travaux Publics et Prives J. Richard Societe Anonyme. Method of constructing reinforced concrete bridges. 4,192,120, Cl. 52-741.000.
Richard, Leroy J. Hydraulic coupler assembly. 4,192,347, Cl. 137-614.060.
Richardson-Merrell Inc.: *See—*
Parker, Roger A., 4,192,895, Cl. 424-331.000.
Richco Plastic Company: *See—*
Coules, Ronald A., 4,192,478, Cl. 248-222.300.
Rickard, Lawrence C. Combination of an archery bow and adjustable pulley assembly. 4,192,280, Cl. 124-23.00R.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for explosive expansion toward horizontal free faces for forming an in situ oil shale retort. 4,192,554, Cl. 299-2.000.
Ricoh Company, Ltd.: *See—*
Hasegawa, Keiji; and Tatara, Yoshikuni, 4,193,071, Cl. 340-723.000.
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,192,677, Cl. 430-77.000.
Tani, Tatsuo; and Kono, Masao, 4,192,609, Cl. 355-77.000.
Rideout, Walker H.; and Mansell, John D., to PPG Industries, Inc. Vapor phase chlorination of 1,1-dichloroethane. 4,192,823, Cl. 260-658.00R.
Rieder, Alois: *See—*
Wagensonner, Eduard; Rieder, Alois; and von Fischern, Bernhard, 4,192,588, Cl. 354-43.000.
Riege, Wilhelm: *See—*
Westerhoff, Heinz; and Riege, Wilhelm, 4,192,644, Cl. 432-122.000.
Riegler, Ernst; and Schmidt, Manfred, to Voest-Alpine Aktiengesellschaft. Rotatable or tiltable metallurgical vessel. 4,192,491, Cl. 266-245.000.
Rieter Machine Works, Ltd.: *See—*
Vetterli, Walter, 4,192,128, Cl. 57-290.000.
Rinehart, Dale W., to PPG Industries, Inc. Ion exchange strengthening of soda-lime-silica glass. 4,192,689, Cl. 106-52.000.
Ringwood, Alfred E.: *See—*
Bird, John M.; and Ringwood, Alfred E., 4,192,765, Cl. 252-301.10W.
Riordan, John. Sailing vessel. 4,192,247, Cl. 114-39.000.
Ritakallio, Pekka: *See—*
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, 4,192,490, Cl. 266-225.000.
Robbins Company, The: *See—*
Grandori, Carlo, 4,192,556, Cl. 299-56.000.
Robert Bosch GmbH: *See—*
Gerstenmeier, Jurgen; Klotz, Hermann; and Leiber, Heinz, 4,192,180, Cl. 73-121.000.
Lang, Thomas; and Zoske, Karl-Heinz, 4,192,272, Cl. 123-140.0MC.
Leiber, Heinz, 4,192,557, Cl. 303-114.000.
Maisch, Wolfgang; and Burkel, Rainer, 4,192,279, Cl. 123-198.00F.
Moser, Theo, 4,192,361, Cl. 141-82.000.
Pagel, Ernst-Olav, 4,193,041, Cl. 331-65.000.
Peters, Klaus-Jurgen; Wissmann, Michael; and Schelhas, Peter, 4,192,271, Cl. 123-139.0AW.
Wanner, Karl; and Reibetanz, Wilbert, 4,192,390, Cl. 173-75.000.
Robertshaw Controls Company: *See—*
Frankenberg, Alfred A., 4,192,453, Cl. 236-87.000.
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., to Ciba-Geigy Corporation. Process for making dustless, readily-dispensible pigment granules. 4,192,841, Cl. 264-117.000.
Robillard, Jean J., to Wahl, Pierre. Texturizing a textile product. 4,192,048, Cl. 28-246.000.
Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Method for reducing oligomeric cyclic ether content of a polymerizate. 4,192,943, Cl. 528-417.000.
Robinson, Joseph G.; and Barnes, David I., to Coal Industry (Patents) Limited. Aromatic hydrocarbon resins. 4,192,824, Cl. 5855-409.000.
Robinson, Ralph C., to General Time Corporation. Adjustment of readout members in a digital clock. 4,192,136, Cl. 368-222.000.
Robinson, Thomas C. Radial piston engine. 4,192,221, Cl. 91-487.000.
Rockwell, Edward T., Sr.: *See—*
Heffernan, William R.; Vega, Mary-Louise; and Rockwell, Edward T., Sr., 4,193,109, Cl. 362-34.000.
Rockwell International Corporation: *See—*
Khan, Mahboob; Godejahn, Jr. Gordan C.; Heimbigner, Gary L.; and Aghishian, Noubar A., 4,192,059, Cl. 29-571.000.
Nyhus, Orville K., 4,193,048, Cl. 333-26.000.
Rockwood, Stephen D.: *See—*
Brau, Charles A.; Stein, William E.; and Rockwood, Stephen D., 4,193,043, Cl. 331-94.5PE.
Rodert, Axel, administrator: *See—*
Friebe, Herbert, deceased; Rodert, Axel, administrator; and Reininghaus, Ulrich, 4,192,479, Cl. 248-354.00H.
Rodriquez, Oswaldo J. Spoon dropper. 4,192,360, Cl. 141-24.000.
Roeder, Georg; Sachs, Helmut; and Hajok, Dieter, to Messer Griesheim GmbH. Machine mounted torch. 4,192,488, Cl. 266-77.000.
Rogers, Charles M.: *See—*
Schardein, Daniel J.; Rogers, Charles M.; and Vice, Diane N., 4,192,722, Cl. 204-38.00B.
Rohm and Haas Company: *See—*
Amick, David R., 4,192,920, Cl. 521-31.000.
Dales, Mark J., 4,192,921, Cl. 521-38.000.
Romano, John V., to Atari, Inc. Apparatus for securely fastening a circuit board to a circuit board edge connector. 4,193,108, Cl. 361-399.000.
Rooney, Robert L.: *See—*
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., 4,192,841, Cl. 264-117.000.
Roos, Paul P.: *See—*
Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.
Root, Edward J. Solar heating system. 4,192,292, Cl. 126-448.000.
Roozen, Johan C. J. A.: *See—*
Wagemakers, Adrianus J.; Roozen, Johan C. J. A.; and Smit, Jozephus J. M., 4,193,107, Cl. 361-298.000.
Ross, Gray E. D., to Zenith Carburetter Company Limited. Air/fuel ratio metering apparatus for use with an internal combustion engine. 4,192,277, Cl. 123-179.00G.
Ross, Richard T.: *See—*
Worrell, Robert A., Sr.; and Ross, Richard T., 4,192,420, Cl. 206-205.000.
Ross, Waldemar A.: *See—*
Scriver, Richard M., Jr.; and Ross, Waldemar A., 4,192,366, Cl. 152-209.00R.
Rossi, Alberto: *See—*
Ferrini, Pier G.; Goschke, Richard; Sallmann, Alfred; and Rossi, Alberto, 4,192,873, Cl. 424-246.000.
Tronchet, Jean M. J.; Baehler, Bruno; Rossi, Alberto; Baschang, Gerhard; and Sele, Alex, 4,192,868, Cl. 424-180.000.
Roth, Eldon N. Method for forming frozen meat patties. 4,192,899, Cl. 426-513.000.
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Allais, Andre; Meier, Jean; and Dube, Jacques, 4,192,890, Cl. 424-308.000.
Grandadam, Jean A.; Jobard, Alain; and Scheid, Jean-Pierre, 4,192,870, Cl. 424-240.000.
Rucinski, Roland R.: *See—*
Kondur, Nicholas, Jr.; Blomquist, James E.; and Rucinski, Roland R., 4,192,618, Cl. 400-124.000.
Rudd, Wallace C., to Thermatool Corporation. Embedment of hard particles in a metal surface. 4,192,984, Cl. 219-76.170.
Ruetschi, Paul, to Leclanche S.A. Long-life alkaline primary battery. 4,192,914, Cl. 429-206.000.
Rugenstein, Robert W. Solar heated building structure. 4,192,454, Cl. 126-427.000.
Rusch, Kenneth D.: *See—*
Beuch, Wallace E.; O'Konski, George J.; Rusch, Kenneth D.; and Wytaski, Thomas A., 4,193,102, Cl. 360-105.000.
Carlson, John A.; Rusch, Kenneth D.; and Sippel, David L., 4,193,101, Cl. 360-97.000.
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Herring, James M., Jr.; and Russell-French, Harry M., 4,192,238, Cl. 105-133.000.
Rye, Grover W., to Goodyear Tire & Rubber Company, The. Solid or molten reagent treatment of metal tire cord. 4,192,694, Cl. 148-6.110.
S & C Electric Company: *See—*
Bernatt, Joseph; and Steegmueller, Alfred, 4,192,534, Cl. 285-382.200.
Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., 4,193,053, Cl. 337-275.000.
Saalasti, Tapio, to Kemi Oy. Lump peat machine. 4,192,088, Cl. 37-3.000.
Sabatano, Frank. Bandage that contains antiseptic. 4,192,299, Cl. 128-155.000.

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Roeder, Georg; Sachs, Helmut; and Hajok, Dieter, 4,192,488, Cl. 266-77.000.
Sachtler, Jurgen: *See*—
Bartscher, Wolfgang; Sachtler, Jurgen; and Schultner, Roland, 4,192,836, Cl. 261-142.000.
Sacks, Norman M., to Burndy Corporation. Modifiable stop element for cable connector assemblies. 4,192,964, Cl. 174-73.00R.
Sagefors, Karl I.: *See*—
Hallenius, Tore J.; and Sagefors, Karl I., 4,192,629, Cl. 405-128.000.
St. Clair, Richard C., to United States of America, Navy. CCD camera interface circuit. 4,193,093, Cl. 358-160.000.
St. Mary, Ronald J. Massage machine. 4,192,296, Cl. 128-52.000.
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Tanasawa, Yasusi; Muto, Norio; and Saito, Akinori, 4,192,466, Cl. 239-464.000.
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Yamagiwa, Kazuo; Saito, Kaneo; and Numakura, Toshihiko, 4,193,084, Cl. 358-4.000.
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Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, 4,192,594, Cl. 354-90.000.
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Wakazono, Kenji; Ishiguro, Yasuo; and Saito, Toshihisa, 4,192,595, Cl. 354-133.000.
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, to Konishiroku Photo Industry Co., Ltd. Photographic light-sensitive material. 4,192,683, Cl. 430-536.000.
Sakamoto, Koichi: *See*—
Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, 4,192,901, Cl. 426-580.000.
Saleil, Jean: *See*—
Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.
Salem, Robert J., to Deere & Company. Ultrasonic touch control panel. 4,193,049, Cl. 333-141.000.
Sallmann, Alfred: *See*—
Ferrini, Pier G.; Goschke, Richard; Sallmann, Alfred; and Rossi, Alberto, 4,192,873, Cl. 424-246.000.
Salmon, Howard J., to Mobil Oil Corporation. Water based polyvinylchloride dispersion coating composition stabilized with iron carboxylates. 4,192,787, Cl. 260-21.000.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Ski boot with foot-retention device. 4,192,087, Cl. 36-119.000.
Samcoe Holding Corporation: *See*—
Frezza, Robert, 4,192,045, Cl. 26-75.000.
Sandoz, Inc.: *See*—
Hardtmann, Goetz E., 4,192,876, Cl. 424-258.000.
Sandoz Ltd.: *See*—
Wolf, Rainer, 4,192,830, Cl. 260-973.000.
Sands, Eugene A.: *See*—
Finger, Eugene P.; and Sands, Eugene A., 4,193,026, Cl. 324-428.000.
Sankyo Company Limited: *See*—
Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, 4,192,953, Cl. 568-673.000.
Sansui Electric Co. Ltd.: *See*—
Ito, Ryosuke; and Takahashi, Susumu, 4,193,076, Cl. 343-702.000.
Sapian, Vladimir G.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.
Sapunov, Viktor E.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,192,370, Cl. 164-252.000.
Sarco Company, Inc.: *See*—
Hilmer, Milton, 4,192,341, Cl. 137-445.000.
Sargent, Desmond J.: *See*—
Fedida, Samuel; and Sargent, Desmond J., 4,193,121, Cl. 364-900.000.
Sargent, Frank T.; and Butler, Frederick A., to Thetford Corporation. Toilet. 4,192,027, Cl. 4-441.000.
Sasaki, Masaomi: *See*—
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,192,677, Cl. 430-77.000.
Sasaki, Yoshiyuki; and Harada, Kiyoshi, to Teijin Limited. Method and apparatus for forming a sliver. 4,192,041, Cl. 19-0.350.
Sato, Akihiko; and Araki, Yoshitaka, to Nippon Kogaku K.K. Mirror driving device for use in a single lens reflex camera. 4,192,598, Cl. 354-153.000.
Sato, Tomoyoshi, to Nihon-Yohin Co., Ltd. Tent. 4,192,333, Cl. 135-3.00E.
Sato, Yoshio. Method for manufacturing a base of a semi-conductor device. 4,192,063, Cl. 29-591.000.
Sato, Yuuichi: *See*—
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.
Saunders, Elmer J.: *See*—
Kajinami, Shingo; Saunders, Elmer J.; and Schnell, Philip G., 4,192,897, Cl. 426-60.000.
Saunders, Ian C. B.: *See*—
Lovell, Peter J.; and Saunders, Ian C. B., 4,192,935, Cl. 526-348.600.
Savard, Guy; Lee, Robert G. H.; and Hornsey, Derek, to Canadian Liquid Air Ltd., Air Liquide Canada Ltee. Two zone process for biological treatment of waste water. 4,192,740, Cl. 210-3.000.
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Kato, Hiroshi; Ito, Yoshiaki; Tokonami, Hiroshi; and Sawada, Atsuo, 4,192,649, Cl. 8-138.000.
Scaramucci, Domer. High pressure disc valve. 4,192,484, Cl. 251-173.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Polyhydroxyl compounds containing guanidine groups. 4,192,925, Cl. 521-163.000.
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Schardein, Daniel J.; Rogers, Charles M.; and Vice, Diane N., to Reynolds Metals Company. Composition and method for stannate plating of large aluminum parts. 4,192,722, Cl. 204-38.00B.
Scheibal, Thomas P. Imitation bevel edging. 4,192,905, Cl. 428-80.000.
Scheid, Jean-Pierre: *See*—
Grandadam, Jean A.; Jobard, Alain; and Scheid, Jean-Pierre, 4,192,870, Cl. 424-240.000.
Schelhas, Peter: *See*—
Peters, Klaus-Jurgen; Wissmann, Michael; and Schelhas, Peter, 4,192,271, Cl. 123-139.0AW.
Scherer, Henry W.: *See*—
Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., 4,193,053, Cl. 337-275.000.
Scheubeck, Egmont; and Gehring, Johann, to Siemens Aktiengesellschaft. Pressure digester. 4,192,849, Cl. 422-242.000.
Schick Incorporated: *See*—
Liedtke, Ronald R., 4,192,325, Cl. 132-9.000.
Schievelbein, Vernon H., to Texaco Inc. High conformance enhanced oil recovery process. 4,192,382, Cl. 166-269.000.
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Munker, Erich; Klein, Alfred; and Heitze, Gerhard, 4,192,208, Cl. 83-438.000.
Zilges, Franz-Josef; and Kutz, Heinrich, 4,192,162, Cl. 72-45.000.
Schmandt, Gary M.; Chappelear, Robert N.; and Hand, Ronnie D., to Owens-Corning Fiberglas Corporation. Apparatus for coating glass fibers. 4,192,663, Cl. 65-11.00R.
Schmelz, Helmut; and Schwaen, Werner, to Siemens Aktiengesellschaft. Method for producing a capacitor dielectric with inner blocking layers. 4,192,840, Cl. 264-61.000.
Schmidt, Manfred: *See*—
Riegler, Ernst; and Schmidt, Manfred, 4,192,491, Cl. 266-245.000.
Schmidt, Robert A.: *See*—
Berger, Leo; and Schmidt, Robert A., 4,192,809, Cl. 260-346.710.
Schmidt, Theodore F. Folding stand for bassinet or the like. 4,192,480, Cl. 248-436.000.
Schmitt, Ernst: *See*—
Muether, Manfred; Phleps, Tilman; and Schmitt, Ernst, 4,193,002, Cl. 250-479.000.
Schnell, Philip G.: *See*—
Kajinami, Shingo; Saunders, Elmer J.; and Schnell, Philip G., 4,192,897, Cl. 426-60.000.
Schnell, Werner J., to General Signal Corporation. Diaphragm seal assembly. 4,192,192, Cl. 73-715.000.
Schnell, Werner J., to General Signal Corporation. Liquid filled pressure gauge. 4,192,193, Cl. 73-739.000.
Schnizler, Albrecht, Jr.; and Kieser, Hermann, to Metabowerke GmbH & Co. Deadman's switch. 4,192,982, Cl. 200-157.000.
Schoerner, Roger J.: *See*—
Chia, E. Henry; and Schoerner, Roger J., 4,192,693, Cl. 148-2.000.
Scholl, Inc.: *See*—
Sichak, Stephen, 4,192,086, Cl. 36-44.000.
Schott, Eberhard P., to BASF Aktiengesellschaft. Plant growth regulators. 4,192,671, Cl. 71-121.000.
Schrader, Charles D.: *See*—
Broyles, Marshall W.; and Schrader, Charles D., 4,192,539, Cl. 294-19.00R.
Schreiber, Helmut: *See*—
Bastgen, Wendel; Schreiber, Helmut; and Grumbel, Eugen, 4,192,743, Cl. 210-42.00R.
Schroeder, Robert W., to United States of America, Army. Air conditioning valve. 4,192,349, Cl. 137-878.000.
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Merger, Franz; Towae, Friedrich; and Schroff, Ludwig, deceased, 4,192,949, Cl. 560-67.000.
Schroff, Meinie T., heiress-at-law: *See*—
Merger, Franz; Towae, Friedrich; and Schroff, Ludwig, deceased, 4,192,949, Cl. 560-67.000.
Schuller, James T.; and Haeusser, Harry C., to UMC Industries, Inc. Article dispensing apparatus particularly for use for dispensing food. 4,192,436, Cl. 221-129.000.

Schultner, Roland: *See—*
Bartscher, Wolfgang; Sachtler, Jurgen; and Schultner, Roland, 4,192,836, Cl. 261-142.000.
Schultz, Hans-Joachim: *See—*
Bubik, Alfred; Jox, Rainer; and Schultz, Hans-Joachim, 4,192,710, Cl. 162-198.000.
Schulze-Beckinghausen, Jorg, to Weatherford Lamb, Inc. Apparatus for rotating a tubular member. 4,192,206, Cl. 81-57.180.
Schumacher, Horst: *See—*
Paust, Joachim; and Schumacher, Horst, 4,192,806, Cl. 260-340.700.
Schwaen, Werner: *See—*
Schmelz, Helmut; and Schwaen, Werner, 4,192,840, Cl. 264-61.000.
Schwappach, Dieter, to O & K Orenstein & Koppel Aktiengesellschaft. Retainer for releasably securing a tooth tip of a digger tooth. 4,192,089, Cl. 37-142.00A.
Schwartz, Edward C.; and Leney, Thomas F., to Calspan Corporation. Enhancing radar returns from targets having a small radar cross section. 4,193,074, Cl. 343-16.00M.
Schwartzman, Irwin J., to J. Schwartzman Manufacturing & Supply Co. Self-drilling screw. 4,192,217, Cl. 85-41.000.
Schwarz, Theodor: *See—*
Hilzinger, Fritz; and Schwarz, Theodor, 4,192,315, Cl. 128-346.000.
Schwarzmann, Matthias: *See—*
Broecker, Franz J.; Duembgen, Gerd; Glietenberg, Helmut; Miesen, Ernest; and Schwarzmann, Matthias, 4,192,807, Cl. 260-343.600.
SCM Corporation: *See—*
Moskowitz, Larry N.; and Klar, Erhard, 4,192,672, Cl. 75-0.50C.
Scott, Andrew M., to Wallop Industries Limited. Firing mechanism for percussion caps. 4,192,236, Cl. 102-261.000.
Scott, James, to GTE Automatic Electric Laboratories Incorporated. Pushbutton call transmitter. 4,192,976, Cl. 179-90.00K.
Scott, John B.: *See—*
Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., 4,193,112, Cl. 364-200.000.
Scott Paper Company: *See—*
Bastian, Lehyman J.; and Kley, Richard D., 4,192,442, Cl. 226-127.000.
Worrell, Robert A., Sr.; and Ross, Richard T., 4,192,420, Cl. 206-205.000.
Scriver, Richard M., Jr.; and Ross, Waldemar A., to Goodyear Tire & Rubber Company, The. Pneumatic tire with medium vinyl polybutadiene/polyisoprene blend tread. 4,192,366, Cl. 152-209.00R.
Seberg, Charles H., to Abbott Laboratories. Catheter placement assembly having axial and rotational alignment means. 4,192,305, Cl. 128-214.400.
Sedlak, Adolf; and Friedrich, Horst, to Timex Corporation. Quartz controlled analog watch. 4,192,132, Cl. 368-160.000.
Segal, Paul. Spice rack for storing and displaying spices. 4,192,439, Cl. 222-130.000.
Segmuller, Bruno J. Bottle cap. 4,192,428, Cl. 215-256.000.
Seidel, Don C.: *See—*
Thompson, Philip; Huiatt, Jerry L.; and Seidel, Don C., 4,192,737, Cl. 209-5.000.
Seitzer, Walter H., to Sunoco Energy Development Co. Process for drying and stabilizing coal. 4,192,650, Cl. 44-1.00R.
Sekihara, Takeshi: *See—*
Takahashi, Tsukasa; Sekihara, Takeshi; Emura, Tomoyuki; and Miki, Masayoshi, 4,192,934, Cl. 526-62.000.
Sekisio Kagaku Kogyo Kabushiki Kaisha: *See—*
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, 4,192,793, Cl. 260-42.140.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Hayashi, Motoshige; and Kobayashi, Toshiro, 4,192,839, Cl. 264-45.500.
Sekiya, Fukuo: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,192,135, Cl. 368-62.000.
Selas Corporation of America: *See—*
Lempa, Roman F., 4,192,642, Cl. 431-263.000.
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Tronchet, Jean M. J.; Baehler, Bruno; Rossi, Alberto; Baschang, Gerhard; and Sele, Alex, 4,192,868, Cl. 424-180.000.
Self, James M., to Tanner Chemical Company, Inc. Highly extended, unsaturated polyester resin syrup composition mixture containing basic aluminum chloride, a shaped article comprised of the cured, cross-linked composition and a process of preparing such article. 4,192,791, Cl. 260-40.00R.
Semi-Alloys, Inc.: *See—*
Hascoe, Norman, 4,192,433, Cl. 220-200.000.
Sergienko, Vladimir Y.: *See—*
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.
Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See—*
Paret, Jacques, 4,192,324, Cl. 131-149.000.
Seth, Marion. Vehicle safety light. 4,192,090, Cl. 40-591.000.
Shapiro, Aron L.: *See—*
Polyakov, Sergei A.; Shapiro, Aron L.; and Gankin, Viktor J., 4,192,961, Cl. 585-319.000.
Shapkin, Alexandr F.: *See—*
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.
Sharp Kabushiki Kaisha: *See—*
Morita, Toshiaki; Takatori, Hironari; Makino, Fusao; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,193,056, Cl. 340-146.3AC.
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, 4,192,060, Cl. 29-592.00R.
Sheets, Harold L.: *See—*
Crickard, James L.; and Sheets, Harold L., 4,192,177, Cl. 73-49.500.
Shell Oil Company: *See—*
Kortbeek, Andras G. T. G.; and van der Nat, Adrianus A., 4,192,774, Cl. 252-429.00B.
Singleton, David M., 4,192,770, Cl. 252-414.000.
Sheludyakov, Viktor D.; Kirilin, Alexei D.; Mironov, Vladimir F.; Glushakov, Sergei N.; and Karpman, Yakov S. Method of preparing isocyanates. 4,192,815, Cl. 260-453.00P.
Sherlock, Hugh P., to M.U. Engineering & Mfg. Co. Bedside drainage bag. 4,192,295, Cl. 128-295.000.
Sherman, Mark L.: *See—*
Mixon, James L., Jr.; and Sherman, Mark L., 4,192,214, Cl. 84-327.000.
Sherritt Gordon Mines Limited: *See—*
Hirsch, Horst E.; Higginson, John F.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,192,851, Cl. 423-28.000.
Sheveleva, Elena I.: *See—*
Babich, Vladimir A.; Vitlin, Abram M.; Kolchanov, Arnold P.; and Sheveleva, Elena I., 4,192,489, Cl. 266-88.000.
Sheward, George E.: *See—*
Hayden, Owen; Sheward, George E.; Ormrod, Derek T.; Willby, Christopher R.; and Firth, George F., 4,192,374, Cl. 165-158.000.
Shibata, Setsuo: *See—*
Hashimoto, Noboru; Fukuda, Hideo; and Shibata, Setsuo, 4,192,833, Cl. 261-36.00R.
Shibayama, Kyoichi; Okahashi, Kazuo; and Hayashi, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Epoxy Resin composition containing glycidyl ether-metal carboxylatecatalyst. 4,192,786, Cl. 260-18.0EP.
Shields, Charles H.; and Kane, Gary D., to Harnischfeger Corporation. Heating system for machine operator's cab. 4,192,456, Cl. 237-12.30R.
Shinagawa Chemical Industry Co., Ltd.: *See—*
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, 4,192,793, Cl. 260-42.140.
Shingu, Tadashi: *See—*
Horike, Akihiro; Itakura, Yoshio; and Shingu, Tadashi, 4,192,685, Cl. 430-283.000.
Shinoda, Toshihiko: *See—*
Tanaka, Atsushi; Shinoda, Toshihiko; and Mimura, Masahisa, 4,192,928, Cl. 521-177.000.
Shinto Paint Co., Ltd.: *See—*
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.
Shiratori, Harunori; and Kikuchi, Kenichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Stabilizer mounting means. 4,192,529, Cl. 280-689.000.
Shirayama, Shimpey; Konagai, Chikara; Terasawa, Michitaka; and Kimura, Hironobu, to Tokyo Shibaura Electric Co., Ltd. Radiation detector adapted for use with a scanner. 4,193,000, Cl. 250-385.000.
Shkhiyan, Tsolak G.: *See—*
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; Borodin, Ivan V.; Chernomordik, Evgeny N.; and Osipov, Vitaly G., 4,192,715, Cl. 176-30.000.
Shoji, Shinichi: *See—*
Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, 4,192,901, Cl. 426-580.000.
Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See—*
Iizumi, Tomomitsu, 4,192,346, Cl. 137-599.000.
Shuster, Edward J.: *See—*
Hall, John B.; Hruza, Denis E., Sr.; Shuster, Edward J.; Vock, Manfred H.; and Vinals, Joaquin F., 4,192,782, Cl. 252-522.00R.
Shutt, Joseph A.: *See—*
Reedman, David C.; Shutt, Joseph A.; and Peck, Alan M., 4,192,033, Cl. 12-10.100.
Sichak, Stephen, to Scholl, Inc. Deodorizing insole. 4,192,086, Cl. 36-44.000.
Siclari, Francesco, to Snia Viscoas Societa Nazionale Industria Applicazioni Viscosa S.p.A. Omega-hydroxy alkenoic acid. 4,192,813, Cl. 260-410.90R.
Siebens, Larry N.: *See—*
Stanger, Robert J.; and Siebens, Larry N., 4,192,572, Cl. 339-111.000.
Siegel, Milton I., to AMBA Marketing Systems, Inc. Organizer handbag. 4,192,365, Cl. 150-35.000.
Siegelin, Werner: *See—*
Gawlick, Heinz; Marondel, Gunter; and Siegelin, Werner, 4,192,837, Cl. 264-3.00E.
Siemens Aktiengesellschaft: *See—*
Baumann, Heinz, 4,192,997, Cl. 250-445.00T.
Berghof, Winfried; and Pichler, Alfred, 4,192,985, Cl. 219-121.0EM.
Bodlaj, Viktor, 4,192,612, Cl. 356-381.000.

Heinzelmann, Karl-Georg; and Klein, Sigismund, 4,192,495, Cl. 271-10.000.
Knauer, Karl; and Pfleiderer, Hans J., 4,193,050, Cl. 333-165.000.
Liebetruth, Reiner; and Mika, Norbert, 4,193,001, Cl. 250-445.00T.
Mayer, Max, 4,192,966, Cl. 178-3.000.
Muether, Manfred; Phleps, Tilman; and Schmitt, Ernst, 4,193,002, Cl. 250-479.000.
Scheubeck, Egmont; and Gehring, Johann, 4,192,849, Cl. 422-242.000.
Schmelz, Helmut; and Schwaen, Werner, 4,192,840, Cl. 264-61.000.

Siempelkamp Giesserei KG: *See—*
Gross, Heiko, 4,192,717, Cl. 176-87.000.

Silver, Roger C.: *See—*
Wyckoff, Frank K.; and Silver, Roger C., 4,192,626, Cl. 404-123.000.

Simko, Paul; and Strasser, Albert, to Brass & Bronze Mfg. Co. Ltd. Swinging door structures for exterior telephone booths. 4,192,099, Cl. 49-366.000.

Simpson, Cullie M. Alarm system for platform scale. 4,192,394, Cl. 177-45.000.

Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 4,192,118, Cl. 52-714.000.

Singer Company, The: *See—*
Deaton, Ion V.; and Horman, Frederick H., 4,192,082, Cl. 35-10.400.
Kothe, Erich, 4,192,980, Cl. 200-83.0WM.

Singh, Medilen S. Three dimensional puzzle figure. 4,192,509, Cl. 273-157.00R.

Singleton, David M., to Shell Oil Company. Cracking catalyst restoration with boron compounds. 4,192,770, Cl. 252-414.000.

Sippel, David L.: *See—*
Carlson, John A.; Rusch, Kenneth D.; and Sippel, David L., 4,193,101, Cl. 360-97.000.

Skelton, John: *See—*
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,192,020, Cl. 3-1.500.

Skemmill Limited: *See—*
Nolan, John P. S., 4,192,126, Cl. 57-3.000.

Slavin, Michael; and Rea, Irvin B., to Lectron Products, Inc. Control circuit for a tone generator. 4,193,060, Cl. 340-52.00D.

Slinkard, William E.; and Baylis, Anthony B., to Celanese Corporation. Hydrocarbon oxidation process. 4,192,951, Cl. 562-549.000.

Sloan, Denis: *See—*
Farquhar, Bannister W.; and Sloan, Denis, 4,192,336, Cl. 137-15.100.

SMG Suddeutsche Maschinenbau Gesellschaft mbH: *See—*
Baltschun, Horst, 4,192,414, Cl. 192-129.00R.

Smit, Jozephus J. M.: *See—*
Wagemakers, Adrianus J.; Roozen, Johan C. J. A.; and Smit, Jozephus J. M., 4,193,107, Cl. 361-298.000.

Smith, Bernard. 4-Jaw work holding chucks. 4,192,521, Cl. 279-112.000.

Smith, Clarence G., to Mobil Oil Corporation. System for displaying seismic data on a cathode-ray tube. 4,193,058, Cl. 367-71.000.

Smith, Ernest L., to Phillips Petroleum Company. Pour spout for a container. 4,192,440, Cl. 222-528.000.

Smith, Eugene L., Jr.: *See—*
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,192,739, Cl. 209-166.000.

Smith, Harry M.: *See—*
Parker, William D.; Smith, Harry M.; and Edwards, Margaret P., 4,192,697, Cl. 156-188.000.

Smith, Hosea E., to Exxon Research & Engineering Co. Gasket retaining spring. 4,192,515, Cl. 277-11.000.

Smith, John K.: *See—*
Collins, Marcus H.; and Smith, John K., 4,192,702, Cl. 156-416.000.

Smith, John R. E., to Dresser Industries, Inc. Method and apparatus for logging inclined earth boreholes. 4,192,380, Cl. 166-250.000.

Smith, Kent F., to General Instrument Corporation. I^2L Ram unit. 4,193,126, Cl. 365-174.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,192,879, Cl. 424-273.00R.

Smith, Margaret B. Wheelchair abduction pillow. 4,192,546, Cl. 297-466.000.

Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., to Union Carbide Corporation. Blends of acrylic latexes and derivatives of ester diol alkoxylates. 4,192,789, Cl. 260-29.20E.

Smith, Robert H., to Atlantic Richfield Company. Process for preparing sulfur-containing coal or lignite for combustion having low SO_2 emissions. 4,192,652, Cl. 44-10.00R.

Smith, Steven R.: *See—*
Swerling, Stephen; Smith, Steven R.; and Wiesmann, Thomas W., 4,192,451, Cl. 371-20.000.

Smith, Walton J. Horticultural improvements. 4,192,097, Cl. 47-59.000.

SmithKline Corporation: *See—*
Bondinell, William E.; and Pendleton, Robert G., 4,192,888, Cl. 424-321.000.
Weinstock, Joseph, 4,192,872, Cl. 424-244.000.

Snia Viscoas Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Siclari, Francesco, 4,192,813, Cl. 260-410.90R.

Snyder, Michael D. Multiple pulse timer. 4,193,064, Cl. 340-309.400.

Societe Anonyme de Telecommunications: *See—*
Beaudet, Didier M., 4,193,051, Cl. 333-201.000.

S.A. Manganese Amcor Ltd.: *See—*
Featherstone, Robert A.; Roos, Paul P.; Gericke, Willem A.; Saleil, Jean; Leroy, Pierre J.; and Masson, Jean-Marcel, 4,192,675, Cl. 75-60.000.

Societe des Electrodes et Refractaires Savoie: *See—*
Dumas, Daniel; Lacroix, Serge; and Vallon, Jean, 4,192,730, Cl. 204-294.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Messines, Jean-Paul; Labat, Gaston; and Tramier, Bernard, 4,192,392, Cl. 175-66.000.
Tellier, Jacques; Philippe, Andre; Mathieu, Pierre; and Voirin, Robert, 4,192,857, Cl. 423-576.000.

Sofia, Anthony A. Racquet safety device. 4,192,506, Cl. 273-73.00R.

Soltys, Joseph F., to London Laboratories Limited Co. Compositions and method for inhibiting formation of explosive compounds and conditions in silvering concentrates for electroless deposition of silver. 4,192,686, Cl. 106-1.230.

Solvay & Cie: *See—*
Berger, Eugene; and Bienfait, Charles, 4,192,772, Cl. 252-429.00C.

Soma, Misao: *See—*
Hakamada, Takeshi; Soma, Misao; and Kano, Ikushi, 4,192,352, Cl. 138-149.000.

Song, Hubert, to Sperry Rand Corporation. Phase lock control system with trajectory correction. 4,193,020, Cl. 318-314.000.

Sony Corporation: *See—*
Yamagiwa, Kazuo; Saito, Kaneo; and Numakura, Toshihiko, 4,193,084, Cl. 358-4.000.

Soper, Quentin F., to Eli Lilly and Company. Acetal derivatives of 4-(substituted amino)-3,5-dinitrobenzaldehydes. 4,192,670, Cl. 71-121.000.

Sopizet, Rene: *See—*
Blanchard, Bruno; Legressus, Claude; Massignon, Daniel; Sopizet, Rene; and Stefani, Rene, 4,193,003, Cl. 250-492.00A.

Sousek, Eugene A., to Koehring Company. Cutting reel grinder with automatic control. 4,192,103, Cl. 51-249.000.

Southard, Robert K.: *See—*
Bickford, David E.; Southard, Robert K.; Sucheski, Matthew M.; and Wagner, Earl W., 4,192,207, Cl. 83-42.000.

Southwire Company: *See—*
Chia, E. Henry; and Schoerner, Roger J., 4,192,693, Cl. 148-2.000.

Spanier, Hermann, to Dr. Boy KG. Injection unit for injection molding apparatus. 4,192,616, Cl. 366-79.000.

Spencer, Robert A.: *See—*
Balde, John W.; Spencer, Robert A.; and Thompson, Richard K., Jr., 4,192,062, Cl. 29-857.000.

Sperry Rand Corporation: *See—*
Song, Hubert, 4,193,020, Cl. 318-314.000.

Spevack, Jerome S., to Deuterium Corporation. Thermal control in dual temperature systems. 4,192,847, Cl. 422-198.000.

Spevack, Jerome S., to Deuterium Corporation. Dual temperature exchange systems. 4,192,850, Cl. 422-255.000.

Spielhoff, Horst, to Hermann Berstorff Maschinenbau GmbH. Screw extruder for processing rubber or plastics material. 4,192,617, Cl. 366-83.000.

Spin Physics, Inc.: *See—*
Bixby, James A.; Lemke, James U.; and Lentz, Robert A., 4,193,098, Cl. 360-10.000.

Spinner, Ulrich: *See—*
Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, 4,192,696, Cl. 148-101.000.

Sprague Electric Company: *See—*
Coleman, James H., 4,193,106, Cl. 361-275.000.
Maher, John P.; and Jacobsen, Robert T., 4,192,698, Cl. 156-89.000.

Spreter von Kreudenstein, Emil H. Device to create cooling through use of waste heat. 4,192,148, Cl. 62-116.000.

Stahlecker, Fritz, to Stahlecker, Hans. Movable servicing device for a spinning machine, especially an open end spinning machine. 4,192,129, Cl. 57-301.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,192,129, Cl. 57-301.000.

Stamires, Dennis: *See—*
Alafandi, Hamid; and Stamires, Dennis, 4,192,778, Cl. 252-455.00Z.

Stamm, Kurt, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Highly directional ultrasonic electret transducer. 4,192,977, Cl. 179-111.00E.

Standal, Norman S. Guidance system for irrigation sprinkling apparatus. 4,192,335, Cl. 137-1.000.

Standard Oil Company, The: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,192,776, Cl. 252-432.000.

Standard Oil Company (Indiana): *See—*
Kajinami, Shingo; Saunders, Elmer J.; and Schnell, Philip G., 4,192,897, Cl. 426-60.000.

Stange, Ingvar. Expandable muff mould. 4,192,704, Cl. 156-443.000.

Stanger, Robert J.; and Siebens, Larry N., to Amerace Corporation. Electrical connector apparatus. 4,192,572, Cl. 339-111.000.

Stark, Friedrich: *See—*
Aichert, Hans; Stark, Friedrich; Stephan, Herbert; and Hoffmann, Otto-Horst, 4,192,253, Cl. 118-712.000.

Staten, Ivan C.: *See—*
Pinnock, Jay L.; and Staten, Ivan C., 4,192,458, Cl. 237-51.000.

Stearns, Richard S.; and Hollstein, Elmer J., to Suntech, Inc. Coal extraction process. 4,192,731, Cl. 208-8.0LE.

Stecklein, Gary L., to Deere & Company. Articulated joint including Belleville spring seals maintained in a preselected compressed state. 4,192,622, Cl. 403-146.000.

Steegmueller, Alfred: *See*—
Bernatt, Joseph; and Steegmueller, Alfred, 4,192,534, Cl. 285-382.200.
Stefani, Rene: *See*—
Blanchard, Bruno; Legressus, Claude; Massignon, Daniel; Sopizet, Rene; and Stefani, Rene, 4,193,003, Cl. 250-492.00A.
Stein, Thomas R.: *See*—
Pavlica, Robert T.; Stein, Thomas R.; and Streed, Carl W., 4,192,734, Cl. 208-80.000.
Stein, William E.: *See*—
Brau, Charles A.; Stein, William E.; and Rockwood, Stephen D., 4,193,043, Cl. 331-94.5PE.
Steinberger, Ned. Stringed musical instruments. 4,192,213, Cl. 84-293.000.
Stephan, Herbert: *See*—
Aichert, Hans; Stark, Friedrich; Stephan, Herbert; and Hoffmann, Otto-Horst, 4,192,253, Cl. 118-712.000.
Stepien, Henryk K.: *See*—
Gandhi, Haren S.; Watkins, William L.; and Stepien, Henryk K., 4,192,779, Cl. 252-470.000.
Sterrett, Dale E.: *See*—
Deaver, Don A.; and Sterrett, Dale E., 4,192,401, Cl. 181-266.000.
Stevens, John M.; Allen, Grant W.; Cole, John M.; and Mousseau, Timothy K., to Kolene Corporation. Electric heating assembly for a fused bath. 4,192,992, Cl. 219-494.000.
Stiftelsen for Metallurgisk Forskning: *See*—
Nilsson, Per A.; Harryson, Gunnar B.; Larsson, Leif T.; Poderschan, Karl J.; Ritakallio, Pekka; and Lehner, Theo, 4,192,490, Cl. 266-225.000.
Stineman, Thomas L.; Edwards, Jeffrey D.; and Grosskopf, Jack C., to Kroger Co., The. Production of Baker's yeast from acid whey. 4,192,918, Cl. 435-256.000.
Stinson, Theodore W. Cylindrical drum tiller attachment. 4,192,387, Cl. 172-21.000.
Stiron Chemical Industry Co. Ltd.: *See*—
Ohno, Tasuku, 4,192,514, Cl. 274-1.00A.
Stitzer, Steven N.: *See*—
Carter, Philip S.; Stitzer, Steven N.; and Goldie, Harry, 4,193,047, Cl. 333-17.00L.
Stoffel, James C., to Xerox Corporation. Image interpolation system. 4,193,092, Cl. 358-136.000.
Stoffel, James C., to Xerox Corporation. Half tone encoder/decoder. 4,193,096, Cl. 358-260.000.
Stoner, Larry L., to Aspro, Inc. Centrifugal clutch with shoe stops. 4,192,412, Cl. 192-105.0CD.
Strahan, Travis R. Platform ramp sight for firearms. 4,192,075, Cl. 33-257.000.
Strasser, Albert: *See*—
Simko, Paul; and Strasser, Albert, 4,192,099, Cl. 49-366.000.
Strautz, Michael G., to Bell Telephone Laboratories, Incorporated. Electrical connector strain relief housing. 4,192,571, Cl. 339-103.00M.
Streed, Carl W.: *See*—
Pavlica, Robert T.; Stein, Thomas R.; and Streed, Carl W., 4,192,734, Cl. 208-80.000.
Stroud, Robert J., to Lansing Bagnall Limited. Battery locating device. 4,192,397, Cl. 180-68.500.
Studebaker, Irving G.; and Hefelfinger, Richard, to Occidental Oil Shale, Inc. Method for attenuating seismic shock from detonating explosive in an in situ oil shale retort. 4,192,553, Cl. 299-2.000.
Studiengesellschaft Kohle mbH.: *See*—
Nicolau, Yves-Claude; and Gersonde, Klaus, 4,192,869, Cl. 424-199.000.
Stueben, Kenneth C., to Union Carbide Corporation. Cumene oxidation using 'onium catalysts. 4,192,952, Cl. 568-574.000.
Styles, Peter: *See*—
Hoult, David I.; and Styles, Peter, 4,193,024, Cl. 324-313.000.
Sucheski, Matthew M.: *See*—
Bickford, David E.; Southard, Robert K.; Sucheski, Matthew M.; and Wagner, Earl W., 4,192,207, Cl. 83-42.000.
Sugasawa, Fukashi: *See*—
Iizuka, Haruhiko; Sugasawa, Fukashi; Matsumoto, Junichiro; and Etoh, Yukihiro, 4,192,278, Cl. 123-198.00F.
Sugerman, Gerald; and Monte, Salvatore J., to Kenrich Petrochemicals, Inc. Atactic polypropylene. 4,192,792, Cl. 260-42.140.
Sugihara, Kunihiko: *See*—
Ohoda, Michio; Nakajima, Yasuo; Sugihara, Kunihiko; and Nagumo, Shin-ichi, 4,192,262, Cl. 123-75.00B.
Sugino, Morihiko: *See*—
Godai, Tomokazu; Sugiyama, Tohru; Sugino, Morihiko; Kondo, Masaru; and Ogawa, Tsuneshi, 4,192,175, Cl. 73-19.000.
Sugiuchi, Tadashi: *See*—
Nakagawa, Takashi; Sugiuchi, Tadashi; Iwashita, Kanau; and Uchida, Masaaki, 4,192,402, Cl. 181-256.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, 4,192,403, Cl. 181-268.000.
Nakagawa, Takashi; Sugiuchi, Tadashi; and Iwashita, Kanau, 4,192,404, Cl. 181-272.000.
Sugiyama, Tohru: *See*—
Godai, Tomokazu; Sugiyama, Tohru; Sugino, Morihiko; Kondo, Masaru; and Ogawa, Tsuneshi, 4,192,175, Cl. 73-19.000.
Suh, John T.; and Bare, Thomas M., to Nicholas International Limited. Process of preparing amino ethanols. 4,192,805, Cl. 260-340.50R.
Sukornick, Bernard F.: *See*—
Sweeney, Richard F.; and Sukornick, Bernard F., 4,192,822, Cl. 260-653.000.
Suling, Carlhans: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Hardt, Dietrich, 4,192,940, Cl. 528-370.000.
Sulzer Brothers Limited: *See*—
Haegele, Gerd, 4,192,142, Cl. 60-322.000.
Haegele, Gerd, 4,192,143, Cl. 60-322.000.
Hintsch, Otto, 4,192,353, Cl. 139-307.000.
Pfarrwaller, Erwin, 4,192,354, Cl. 139-342.000.
Pfarrwaller, Erwin, 4,192,356, Cl. 139-439.000.
Sumitomo Chemical Company, Limited: *See*—
Takahashi, Tsukasa; Sekihara, Takeshi; Emura, Tomoyuki; and Miki, Masayoshi, 4,192,934, Cl. 526-62.000.
Sunnen Products Company: *See*—
Vanderwal, Frank E., Jr., 4,192,073, Cl. 33-178.00B.
Sunoco Energy Development Co.: *See*—
Seitzer, Walter H., 4,192,650, Cl. 44-1.00R.
Suntech, Inc.: *See*—
Stearns, Richard S.; and Hollstein, Elmer J., 4,192,731, Cl. 208-8.0LE.
Suzuki, Masane; and Yasuda, Kenzi, to Fuji Photo Optical Co., Ltd. Method of projecting a line image of uniform brightness. 4,192,578, Cl. 350-320.000.
Svitenko, Igor A.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Svitenko, Igor A.; and Sapunov, Viktor E., 4,192,370, Cl. 164-252.000.
Swan, Harris K.: *See*—
Gilbert, Judson T.; Harrison, George R.; Holbrook, Alan R.; Levy, Michael; Scott, John B.; and Swan, Harris K., 4,193,112, Cl. 364-200.000.
Swanson, Wilbur M.: *See*—
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,192,020, Cl. 3-1.500.
Swearingen, Gloria K. Portable dressing table or vanity. 4,192,329, Cl. 132-79.00R.
Sweeney, Richard F.; and Sukornick, Bernard F., to Allied Chemical Corporation. Process for producing halogenated hydrocarbons. 4,192,822, Cl. 260-653.000.
Swerling, Stephen; Smith, Steven R.; and Wiesmann, Thomas W., to Tektronix, Inc. Digital diagnostic system employing signature analysis. 4,192,451, Cl. 371-20.000.
Swift, Harold E.: *See*—
Giannetti, Joseph P.; and Swift, Harold E., 4,192,653, Cl. 44-51.000.
Swift, Thomas G.: *See*—
Bomball, William A.; and Swift, Thomas G., 4,192,783, Cl. 260-8.000.
Swinkels, Godefridus M.: *See*—
Hirsch, Horst E.; Higginson, John F.; Parker, Ernest G.; and Swinkels, Godefridus M., 4,192,851, Cl. 423-28.000.
Sybron Corporation: *See*—
Madhavan, Narayanan; and Freeman, Frank H., 4,192,795, Cl. 260-42.520.
Sylvester, G. Clay. Method for performing step rate tests on injection wells. 4,192,182, Cl. 73-155.000.
Syntex Puerto Rico, Inc.: *See*—
Poulsen, Boyd J., 4,192,309, Cl. 128-203.150.
Sysoev, Vladimir S.: *See*—
Vydrin, Vladimir N.; Barkov, Leonid A.; Pastukhov, Valery V.; Dolgov, Sergei I.; and Sysoev, Vladimir S., 4,192,165, Cl. 72-238.000.
Systemes de Traitements de Surfaces S.A.: *See*—
Laude, Pierre; Marka, Erwin; and Zuntini, Franco, 4,192,723, Cl. 204-43.00G.
Szema, Li-Chieh, to Westinghouse Electric Corp. Gas turbine combustor air inlet. 4,192,138, Cl. 60-759.000.
Szmuszkovicz, Jacob, to Upjohn Company, The. Analgesic N-{2-[N'-(2-furylmethyl and 2-thienyl-methyl)-N'-alkylamino]cycloaliphatic}-cyanobenzamides. 4,192,885, Cl. 424-275.000.
Tabickman, Maurice L.; and Dempsey, Douglas E., to Pepsico, Inc. Game racket. 4,192,505, Cl. 273-73.00C.
Tadanier, John S.: *See*—
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,192,867, Cl. 424-180.000.
Taguchi, Masahiro: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.
Taikisha Ltd.: *See*—
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.
Tajkowski, Edward G., to Allied Chemical Corporation. Amino resin foam, one-phase solution foam precursor and method of producing foam. 4,192,923, Cl. 521-117.000.
Takahashi, Kazuo: *See*—
Nishina, Yoshio; Matsuo, Syunji; Nagatani, Toshio; Takahashi, Kazuo; and Habu, Takeshi, 4,192,682, Cl. 430-405.000.
Takahashi, Susumu: *See*—
Ito, Ryosuke; and Takahashi, Susumu, 4,193,076, Cl. 343-702.000.
Takahashi, Tsukasa; Sekihara, Takeshi; Emura, Tomoyuki; and Miki, Masayoshi, to Sumitomo Chemical Company, Limited. Equipment for polymerization of vinyl chloride monomers and polymerization process using the same. 4,192,934, Cl. 526-62.000.
Takata, Akira: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,192,268, Cl. 123-119.0EC.

Takatori, Hironari: *See—*
Morita, Toshiaki; Takatori, Hironari; Makino, Fusao; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,193,056, Cl. 340-146.3AC.
Takeuchi, Eiichi, to Casio Computer Co., Ltd. Time counting control system. 4,192,130, Cl. 368-155.000.
Takeuchi, Tomio: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, 4,192,915, Cl. 435-78.000.
Tamura, Keiichi: *See—*
Inukai, Mitsuo; Iwatsuki, Masahiro; and Tamura, Keiichi, 4,192,474, Cl. 242-107.40A.
Tanahashi, Toshio: *See—*
Amano, Masuo; and Tanahashi, Toshio, 4,192,265, Cl. 123-119.00A.
Tanaka, Atsushi; Shinoda, Toshihiko; and Mimura, Masahisa, to Teijin Limited. Thermoplastic polyurethane and process for the preparation thereof. 4,192,928, Cl. 521-177.000.
Tanaka, Seiyo, to Nihon Sekiyu Hanbai Kabushiki Kaisha. Process for utilizing energy produced by the phase change of liquid. 4,192,145, Cl. 60-675.000.
Tanaka, Shigenori; Tojo, Akio; Ohnishi, Kimimasa; and Kikuchi, Takeshi, to Nissan Motor Company, Limited. Weft yarn grasping apparatus for fluid jet loom. 4,192,357, Cl. 139-450.000.
Tanaka, Toshio: *See—*
Nakagawa, Sumio; Tanaka, Toshio; and Todo, Kenji, 4,192,641, Cl. 431-15.000.
Tanasawa, Yasusi; Muto, Norio; and Saito, Akinori, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Swirl injection valve. 4,192,466, Cl. 239-464.000.
Tani, Tatsuo; and Kono, Masao, to Ricoh Co., Ltd. Method for effecting registration for a copying apparatus. 4,192,609, Cl. 355-77.000.
Tanioka, Katsuhiko; Matsuzawa, Toshihiko; Iida, Noboru; Makino, Naoji; and Hayasaka, Itirow, to Sekisio Kagaku Kogyo Kabushiki Kaisha; and Shinagawa Chemical Industry Co., Ltd. Stabilizers for chlorine-containing resins. 4,192,793, Cl. 260-42.140.
Tanner Chemical Company, Inc.: *See—*
Self, James M., 4,192,791, Cl. 260-40.00R.
Tapio, Olli; Veijonen, Lassi; and Hannonen, Eero, to Valmetoy. Paper-manufacturing method and apparatus for conveying a web from a forming wire to a drying section. 4,192,711, Cl. 162-199.000.
Tarayre, Jean-Pierre: *See—*
Cousse, Henri; Bonnaud, Bernard; Tarayre, Jean-Pierre; and Casadio, Silvano, 4,192,883, Cl. 424-274.000.
Tatara, Yoshikuni: *See—*
Hasegawa, Keiji; and Tatara, Yoshikuni, 4,193,071, Cl. 340-723.000.
Tatejima, Masakazu: *See—*
Oya, Hiroo; and Tatejima, Masakazu, 4,192,846, Cl. 422-168.000.
Tateoka, Kiyoshi, to Tokico Ltd. Vacuum booster. 4,192,220, Cl. 91-376.00R.
Taylor, Ian D., to Hunter Douglas International N.V., ANX. Adjustable decorative shutter. 4,192,369, Cl. 160-223.000.
Technisub S.p.A.: *See—*
Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, 4,192,298, Cl. 128-205.240.
Teijin Limited: *See—*
Horike, Akihiro; Itakura, Yoshio; and Shingu, Tadashi, 4,192,685, Cl. 430-283.000.
Sasaki, Yoshiyuki; and Harada, Kiyoshi, 4,192,041, Cl. 19-0.350.
Tanaka, Atsushi; Shinoda, Toshihiko; and Mimura, Masahisa, 4,192,928, Cl. 521-177.000.
Teijin Seiki Company Limited: *See—*
Yamamoto, Toru, 4,192,218, Cl. 91-216.00A.
Tektronix, Inc.: *See—*
Swerling, Stephen; Smith, Steven R.; and Wiesmann, Thomas W., 4,192,451, Cl. 371-20.000.
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Von Viebahn, Hans E.; and Tengler, Julius, 4,192,632, Cl. 405-298.000.
Tenneco Inc.: *See—*
Deaver, Don A.; and Sterrett, Dale E., 4,192,401, Cl. 181-266.000.
Terabayashi, Takeshi: *See—*
Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, 4,192,901, Cl. 426-580.000.
Terada, Sadatugu: *See—*
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.
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Shirayama, Shimpey; Konagai, Chikara; Terasawa, Michitaka; and Kimura, Hironobu, 4,193,000, Cl. 250-385.000.
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Phillips, Clarence A. L.; and Archer, Henry W., 4,192,668, Cl. 71-70.000.
Texaco Inc.: *See—*
Cobb, John M., 4,192,267, Cl. 123-119.00A.
Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., 4,192,755, Cl. 252-8.55D.
Flournoy, Kenoth H.; Alston, Robert B.; and Braden, William B., Jr., 4,192,767, Cl. 252-312.000.
Powers, John R., 4,192,835, Cl. 261-114.00A.
Schievelbein, Vernon H., 4,192,382, Cl. 166-269.000.
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Phillips, Clarence A. L.; and Archer, Henry W., 4,192,668, Cl. 71-70.000.
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Mondshine, Thomas C., 4,192,756, Cl. 252-8.55R.
Texas Instruments Incorporated: *See—*
Bullock, David C., 4,193,124, Cl. 365-12.000.
Textron Inc.: *See—*
Decaro, Charles J., 4,192,459, Cl. 238-356.000.
Thayer, Robert H. Chemically dehydrated cold camera. 4,192,592, Cl. 354-76.000.
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Kiehs, Karl; and Theobald, Hans, 4,192,831, Cl. 260-987.000.
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Rudd, Wallace C., 4,192,984, Cl. 219-76.170.
Thermo Electron Corporation: *See—*
Dunlap, Harold E., 4,192,709, Cl. 162-111.000.
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Bertozzi, Eugene R., 4,192,941, Cl. 528-374.000.
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Logan, Maurus C.; Cole, John M.; and Garner, Peter, 4,192,056, Cl. 29-468.000.
Thomas, Erwin: *See—*
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Cancelleri, Dan; and Thompson, Charles E., 4,192,729, Cl. 204-272.000.
Thompson, Philip; Huiatt, Jerry L.; and Seidel, Don C., to United States of America, Interior. Froth flotation of insoluble slimes from sylvinite ores. 4,192,737, Cl. 209-5.000.
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Balde, John W.; Spencer, Robert A.; and Thompson, Richard K., Jr., 4,192,062, Cl. 29-857.000.
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Henry, Raymond; Resneau, Jean-Claude; and Bouvet, Jean-Victor, 4,192,574, Cl. 350-96.170.
Thonissen, Willi, to NIKO Konserven-Maschinenfabrik Hinsbek GmbH & Co., KG. Device for transferring piece material, in particular pieces of fruit or vegetable. 4,192,416, Cl. 198-433.000.
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Tietjens, Eduard W., to U.S. Philips Corporation. Shaving apparatus. 4,192,065, Cl. 30-43.600.
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Alicot, Michel J. C.; Rhode, Rene H. P.; and Tignol, Adrien P. N., 4,192,804, Cl. 548-177.000.
Timex Corporation: *See—*
Sedlak, Adolf; and Friedrich, Horst, 4,192,132, Cl. 368-160.000.
Tims, Allan C.: *See—*
Young, A. Mark; Henriquez, Theodore A.; and Tims, Allan C., 4,193,130, Cl. 367-149.000.
Ting, Lawrence K. M., to Polaroid Corporation. Photographic apparatus for selectively actuating a pulsable electronic strobe. 4,192,597, Cl. 354-145.000.
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Onodera, Takashi; Komine, Kikuji; and Ohashi, Fumio, 4,192,732, Cl. 208-33.000.
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumio; and Naito, Tsutomu, 4,192,733, Cl. 208-33.000.
Toda, Shinichi: *See—*
Minami, Takeshi; and Toda, Shinichi, 4,192,724, Cl. 204-67.000.
Todd, Robert B.: *See—*
Robertson, George H.; Rooney, Robert L.; and Todd, Robert B., 4,192,841, Cl. 264-117.000.
Todo, Kenji: *See—*
Nakagawa, Sumio; Tanaka, Toshio; and Todo, Kenji, 4,192,641, Cl. 431-15.000.
Todoroki, Nobuaki: *See—*
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.
Toho Chemical Industry Co., Ltd.: *See—*
Hamanaka, Hiroyoshi, 4,192,759, Cl. 252-78.100.
Tojo, Akio: *See—*
Tanaka, Shigenori; Tojo, Akio; Ohnishi, Kimimasa; and Kikuchi, Takeshi, 4,192,357, Cl. 139-450.000.
Tokico Ltd.: *See—*
Tateoka, Kiyoshi, 4,192,220, Cl. 91-376.00R.
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Kato, Hiroshi; Ito, Yoshiaki; Tokonami, Hiroshi; and Sawada, Atsuo, 4,192,649, Cl. 8-138.000.

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Ogata, Shunji; and Yamamoto, Yohei, 4,192,662, Cl. 62-13.000.
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Masuzima, Sho; and Fujita, Hisashi, 4,192,061, Cl. 29-854.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Aoki, Mitsugu; Konishi, Yoshikazu; and Ishihara, Taketoshi, 4,192,582, Cl. 351-30.000.
Tokyo Magnetic Printing Company Ltd.: *See—*
Hayashi, Hideaki, 4,193,099, Cl. 360-17.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Moriya, Yoshiaki, 4,193,125, Cl. 365-104.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Horiike, Yasuhiro, 4,192,706, Cl. 156-643.000.
Imamura, Makoto, 4,193,085, Cl. 358-8.000.
Koyama, Mitsuaki, 4,192,604, Cl. 355-3.0DD.
Shirayama, Shimpey; Konagai, Chikara; Terasawa, Michitaka; and Kimura, Hironobu, 4,193,000, Cl. 250-385.000.
Tomy Kogyo Co., Inc.: *See—*
Hamano, Nobuo, 4,192,093, Cl. 46-204.000.
Topouzian, Armenag, to Ford Motor Company. Sodium sulfur battery seal. 4,192,911, Cl. 429-104.000.
Toppan Printing Co., Ltd.: *See—*
Kawakami, Yoshito, 4,192,231, Cl. 101-425.000.
Torres, Julio A., to Conoco, Inc. Anti-scale stuffing box improvement. 4,192,517, Cl. 277-24.000.
Torrington Company, The: *See—*
Hartnett, Michael J., 4,192,560, Cl. 308-187.000.
Toth, Endre L.: *See—*
Gale, Paul E.; and Toth, Endre L., 4,193,021, Cl. 318-568.000.
Toto, John A., to Pitney-Bowes, Inc. Sheet separating and feeding apparatus. 4,192,498, Cl. 271-21.000.
Touet, Joel: *See—*
Brown, Eric; Boschetti, Egisto; Corgier, Monique M.; and Touet, Joel, 4,192,784, Cl. 260-8.000.
Touze, Francois M. J. Cooling boxes for blast-furnaces. 4,192,258, Cl. 122-6.500.
Towae, Friedrich: *See—*
Merger, Franz; Towae, Friedrich; and Schroff, Ludwig, deceased, 4,192,949, Cl. 560-67.000.
Towlerton, Richard G.; and Lapras, Michel, to Fisons Limited. Methods for treating gastrointestinal disease. 4,192,886, Cl. 424-283.000.
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Nonoyama, Takao; and Yasuda, Takeru, 4,192,141, Cl. 60-290.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Amano, Masuo; and Tanahashi, Toshio, 4,192,265, Cl. 123-119.00A.
Fujii, Takashi; Ohmi, Atsushi; Nogami, Tomoyuki; and Ohta, Takaaki, 4,192,345, Cl. 137-572.000.
Hasegawa, Tadao, 4,192,520, Cl. 277-235.00B.
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,192,268, Cl. 123-119.0EC.
Ishidera, Takashi; and Enjoji, Masahiko, 4,192,660, Cl. 55-276.000.
Kitagawa, Katsutoshi; and Yamauchi, Hiroki, 4,192,263, Cl. 123-90.390.
Okamura, Hiromasa, 4,192,224, Cl. 92-125.000.
Shiratori, Harunori; and Kikuchi, Kenichi, 4,192,529, Cl. 280-689.000.
Traber, Walter: *See—*
Clauson-Kaas, Niels; Mattern, Gunter; and Traber, Walter, 4,192,946, Cl. 546-249.000.
Trace, William L.; and Walker, Jerry L., to Calgon Corporation. Methoxypropylamine and hydrazine steam condensate corrosion inhibitor compositions and methods. 4,192,844, Cl. 422-11.000.
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Nelson, Robert L., 4,192,191, Cl. 73-701.000.
Tramier, Bernard: *See—*
Messines, Jean-Paul; Labat, Gaston; and Tramier, Bernard, 4,192,392, Cl. 175-66.000.
Trane Company, The: *See—*
Kiang, Yen-Hsiung, 4,192,659, Cl. 55-89.000.
Transform Verstarkungsmaschinen Aktiengesellschaft: *See—*
Dits, Herbert R., 4,192,222, Cl. 91-517.000.
Travers, Douglas N.: *See—*
Prucha, Martin J.; Donaldson, Willis L.; and Travers, Douglas N., 4,192,967, Cl. 178-22.000.
Tremblay, Joseph A., to Lorac Company, The. Two piece ornament. 4,192,903, Cl. 428-8.000.
Tresser, Dietfried: *See—*
Huebner, Bernhard; and Tresser, Dietfried, 4,192,167, Cl. 72-356.000.
Trieschock, George E.; and Dunbeker, George H., to Rheem Manufacturing Company. Method for blow molding of thermoplastic articles. 4,192,843, Cl. 264-528.000.
Trochon, Bernard: *See—*
Ferraro, Lugi; Beltrani, Gianni; Gass, Jacques; and Trochon, Bernard, 4,192,298, Cl. 128-205.240.
Tronchet, Jean M. J.; Baehler, Bruno; Rossi, Alberto; Baschang, Gerhard; and Sele, Alex, to Ciba-Geigy Corporation. Novel aryl-hexafuranosides and processes for their preparation. 4,192,868, Cl. 424-180.000.
Trotscher, Gerhard: *See—*
Gageur, Fritz; and Trotscher, Gerhard, 4,192,251, Cl. 118-63.000.
Truesdell, Delbert E.: *See—*
Alderson, Loren L.; and Truesdell, Delbert E., 4,192,337, Cl. 137-101.000.
Truitt, Thomas E. Pendulum device. 4,192,072, Cl. 33-27.00L.
Trutzschler GmbH & Co. KG: *See—*
Jagst, Peter, 4,192,042, Cl. 19-81.000.
TRW Inc.: *See—*
Hayden, Rodney, 4,193,052, Cl. 335-128.000.
Hodge, Malcolm H., 4,192,575, Cl. 350-96.210.
Tsuda, Shin: *See—*
Kurahayashi, Sadasuke; Kato, Yuzo; Tsuda, Shin; Muto, Hakaru; and Watanabe, Asao, 4,193,097, Cl. 358-261.000.
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, to Kanebo, Ltd. 2-Substituted benzimidazole compounds. 4,192,880, Cl. 424-273.00R.
Tsunoi, Haruo; Morikawa, Teruo; Yamada, Katsuhiko; Ohkawara, Kenji; and Kubota, Atsushi, to Canon Kabushiki Kaisha. Fixing apparatus. 4,192,229, Cl. 100-158.00R.
Tuchman, Walter L.: *See—*
Lennon, Richard E.; Matyas, Stephen M.; Meyer, Carl H. W.; Oseas, Jonathan; Prentice, Paul N.; and Tuchman, Walter L., 4,193,131, Cl. 375-2.000.
Tucker, Richard O.: *See—*
Keith, Charles H.; and Tucker, Richard O., 4,192,838, Cl. 264-10.000.
Tucker, Willkie Y. Anti-rape device. 4,192,066, Cl. 30-162.000.
Tung, Chi F.; and Laird, James A., to Minnesota Mining and Manufacturing Company. Ultra-high-index glass microspheres and products made therefrom. 4,192,576, Cl. 350-105.000.
Twiestmeyer, Terry B. Trailer hitch apparatus. 4,192,524, Cl. 280-415.00A.
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Nakagawa, Takashi; Sugiuchi, Tadashi; Iwashita, Kanau; and Uchida, Masaaki, 4,192,402, Cl. 181-256.000.
Uchiyama, Yasuji: *See—*
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, 4,192,211, Cl. 84-1.010.
Udagawa, Tsugio; Araya, Takeshi; and Yoshida, Takashi, to Hitachi, Ltd.; and Hitachi Seiko, Ltd. Method and apparatus for automatic weld line tracing. 4,192,986, Cl. 219-137.00R.
Ueda, Masao, to Kabushiki Kaisha Komatsu Seisakusho. Clutch mechanism for winch. 4,192,409, Cl. 192-4.00R.
Ueda, Yasutsugu, to Bristol-Myers Company. Novel phosphorane intermediates for use in preparing penem antibiotics. 4,192,801, Cl. 260-239.00A.
Ueda, Yuziro; Yoshida, Toru; and Honda, Michiyasu, to Nippon Steel Corporation. Method for controlling exhaust gases in oxygen blown converter. 4,192,486, Cl. 266-44.000.
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Pederson, Paul D., Jr.; Ufford, Keith A.; and Nelson, Lawrence V., 4,192,988, Cl. 219-201.000.
Ultrasonic Plaque Control Laboratories, Inc.: *See—*
Kuris, Arthur, 4,192,035, Cl. 15-22.00R.
UMC Industries, Inc.: *See—*
Schuller, James T.; and Haeusser, Harry C., 4,192,436, Cl. 221-129.000.
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Ishizuka, Masaaki; Naganawa, Hiroshi; Oki, Toshikazu; and Inui, Taiji, to Bristol-Myers Company. Anthracycline glycosides from streptomyces. 4,192,915, Cl. 435-78.000.
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Goshima, Yoshitomo; Hattori, Hiroyuki; Komaba, Shiro; and Umezawa, Kazumi, 4,192,608, Cl. 355-51.000.
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Kuryla, William C.; and Raines, Russell H., 4,192,647, Cl. 8-62.000.
Osborn, Claiborn L., 4,192,762, Cl. 252-182.000.
Smith, Oliver W.; Koleske, Joseph V.; and Knopf, Robert J., 4,192,789, Cl. 260-29.20E.
Stueben, Kenneth C., 4,192,952, Cl. 568-574.000.
Ward, James A., 4,192,727, Cl. 204-159.120.
Union Oil Company of California: *See—*
Duthweiler, Frederick C., 4,192,630, Cl. 405-217.000.
Maly, George P.; and Laurie, Archibald M., 4,192,375, Cl. 166-51.000.
Pye, David S.; Gallus, Julius P.; and Fischer, Paul W., 4,192,753, Cl. 252-8.50A.
Uniroyal, Inc.: *See—*
McKinstry, Paul H.; and Barnhart, Robert R., 4,192,790, Cl. 260-31.2MR.
United Chemical Corporation: *See—*
VanCleave, Jon S., 4,192,766, Cl. 252-305.000.
United Electric Controls Company: *See—*
Reis, Robert D., 4,193,054, Cl. 338-42.000.
United Kingdom Atomic Energy Authority: *See—*
Hayden, Owen; Sheward, George E.; Ormrod, Derek T.; Willby, Christopher R.; and Firth, George F., 4,192,374, Cl. 165-158.000.
United States of America
Air Force: *See—*
Carter, Philip S.; Stitzer, Steven N.; and Goldie, Harry, 4,193,047, Cl. 333-17.00L.
Harris, Richard L., 4,193,059, Cl. 340-27.0AT.
Jacomini, Omar J., 4,192,235, Cl. 102-214.000.
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Morrison, Steven; Lisle, Thomas K., Jr.; and Glover, Clarence C., 4,193,066, Cl. 340-347.0CC.
Prucha, Martin J.; Donaldson, Willis L.; and Travers, Douglas N., 4,192,967, Cl. 178-22.000.
Army: *See—*
Kennedy, Andrew J., 4,192,064, Cl. 29-631.000.
Morrison, Clyde A.; Karayianis, Nick; and Wortman, Donald E., 4,193,044, Cl. 331-94.50F.
Pollehn, Herbert K.; and Bratton, Jerry L., 4,193,011, Cl. 313-94.000.
Schroeder, Robert W., 4,192,349, Cl. 137-878.000.
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Albus, James S., 4,193,115, Cl. 364-300.000.
Energy: *See—*
Brau, Charles A.; Stein, William E.; and Rockwood, Stephen D., 4,193,043, Cl. 331-94.5PE.
Horton, Richard H., 4,192,583, Cl. 353-3.000.
Vachon, Lawrence J., 4,192,714, Cl. 176-22.000.
Health, Education and Welfare: *See—*
Dougherty, Walter S., 4,192,584, Cl. 353-30.000.
Interior: *See—*
Colombo, Arthur F.; and Hopstock, David M., 4,192,738, Cl. 209-5.000.
Thompson, Philip; Huiatt, Jerry L.; and Seidel, Don C., 4,192,737, Cl. 209-5.000.
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Giner, Jose D.; and Cahill, Kathleen J. Catalyst surfaces for the chromous/chromic redox couple. 4,192,910, Cl. 429-101.000.
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Jensen, Ronald N., 4,192,290, Cl. 126-437.000.
Kastner, Sidney O., 4,192,994, Cl. 250-280.000.
Navy: *See—*
Brown, Ray B., Jr., 4,192,573, Cl. 350-55.000.
Cioccio, Armand; and Folz, Walter C., 4,193,029, Cl. 324-301.000.
Farncomb, Robert E.; Mueller, Kurt F.; and Wagaman, Kerry L., 4,192,819, Cl. 260-583.00N.
Himy, Albert; and Wagner, Otto C., 4,192,908, Cl. 429-53.000.
Kendig, Paul M.; Lawther, James M.; and James, Robert G., 4,192,245, Cl. 114-23.000.
McKusick, Wayne L., 4,193,072, Cl. 343-6.0ND.
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St. Clair, Richard C., 4,193,093, Cl. 358-160.000.
Wiggins, Robert W.; Ettenhofer, Kurt L.; and Bess, Jack, 4,193,129, Cl. 367-106.000.
Young, A. Mark; Henriquez, Theodore A.; and Tims, Allan C., 4,193,130, Cl. 367-149.000.
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Barten, Piet G. J., 4,193,015, Cl. 313-408.000.
Berger, Hermann, 4,193,035, Cl. 455-203.000.
Blom, Nico; and Wor, Jan T., 4,192,230, Cl. 101-93.030.
Brockmann, Klaus-Dieter K., 4,192,975, Cl. 179-77.000.
Kleuters, Wilhelm J.; Van Rosmalen, Gerard E.; Bierhoff, Martinus P. M.; and Immink, Kornelis A., 4,193,091, Cl. 358-128.500.
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Voorman, Johannes O., 4,193,033, Cl. 375-88.000.
Wagemakers, Adrianus J.; Roozen, Johan C. J. A.; and Smit, Jozephus J. M., 4,193,107, Cl. 361-298.000.
Welle, Hendricus B. A.; and Claassen, Volkert, 4,192,893, Cl. 424-327.000.
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Jalan, Vinod M.; Landsman, Douglas A.; and Lee, John M., 4,192,907, Cl. 429-40.000.
Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,193,005, Cl. 290-44.000.
University of California, Regents of: *See—*
Hargens, Alan R.; and Mubarak, Scott J., 4,192,319, Cl. 128-748.000.
UOP Inc.: *See—*
Ginger, Edward A., 4,192,855, Cl. 423-239.000.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,192,948, Cl. 560-55.000.
Fitzpatrick, Francis A., 4,192,799, Cl. 260-121.000.
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Szmuszkovicz, Jacob, 4,192,885, Cl. 424-275.000.
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Chong, Antonio T., 4,192,637, Cl. 425-140.000.
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Nietupski, Val J., 4,192,285, Cl. 126-83.000.
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Massa, Richard L.; and Cook, Kenneth J., 4,193,039, Cl. 328-162.000.
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Oswald, Alexis A.; and Valint, Paul L., Jr., 4,192,829, Cl. 260-948.000.
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Vallon, Jean: *See—*
Dumas, Daniel; Lacroix, Serge; and Vallon, Jean, 4,192,730, Cl. 204-294.000.
Valmetoy: *See—*
Tapio, Olli; Veijonen, Lassi; and Hannonen, Eero, 4,192,711, Cl. 162-199.000.
Vance, Ian A. W., to International Standard Electric Corporation. Radio receiver for FSK signals. 4,193,034, Cl. 375-88.000.
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van der Nat, Adrianus A.: *See—*
Kortbeek, Andras G. T. G.; and van der Nat, Adrianus A., 4,192,774, Cl. 252-429.00B.
Vandervoort, John R.: *See—*
Bogema, Edward J.; Vandervoort, John R.; and Bevins, John R., 4,192,196, Cl. 74-339.000.
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McVicker, Gary B.; and Vannice, M. Albert, 4,192,777, Cl. 252-447.000.
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Bagley, James S.; and Van Norden, Gary J., 4,193,100, Cl. 360-73.000.
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Varian Associates, Inc.: *See—*
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Heffernan, William R.; Vega, Mary-Louise; and Rockwell, Edward T., Sr., 4,193,109, Cl. 362-34.000.
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Baselice, Louis R.; Freakes, Anthony; Miller, Joseph A.; and Ventz, George A., 4,192,496, Cl. 271-10.000.
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Kalasek, Karl, 4,192,845, Cl. 422-25.000.
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Klein, Bernard J.; and Verga, Samuel D., 4,192,038, Cl. 15-250.060.
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Schardein, Daniel J.; Rogers, Charles M.; and Vice, Diane N., 4,192,722, Cl. 204-38.00B.
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Ambrosat, Ernest O.; and Weingartner, Arthur, 4,192,447, Cl. 229-72.000.
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Babich, Vladimir A.; Vitlin, Abram M.; Kolchanov, Arnold P.; and Sheveleva, Elena I., 4,192,489, Cl. 266-88.000.
Vivian Manufacturing Company: *See*—
Carpenter, C. Donald, 4,192,151, Cl. 62-320.000.
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Orban, Jean, 4,192,586, Cl. 354-24.000.
Vock, Manfred H.: *See*—
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Voest-Alpine Aktiengesellschaft: *See*—
Riegler, Ernst; and Schmidt, Manfred, 4,192,491, Cl. 266-245.000.
Voirin, Robert: *See*—
Tellier, Jacques; Philippe, Andre; Mathieu, Pierre; and Voirin, Robert, 4,192,857, Cl. 423-576.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Buchheim, Rolf, 4,192,139, Cl. 60-739.000.
Gospodar, Reinhard; and Heidemeyer, Paulus, 4,192,202, Cl. 74-859.000.
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Derouette, Jean-Jacques; Dartoy, Jacques; Fournier, Jacques; and Vollerin, Bernard, 4,192,371, Cl. 165-1.000.
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Volvo BM AB: *See*—
Bergquist, Lennart, 4,192,528, Cl. 280-677.000.
von Fischern, Bernhard: *See*—
Wagensonner, Eduard; Rieder, Alois; and von Fischern, Bernhard, 4,192,588, Cl. 354-43.000.
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Vopilov, Alexandr N.: *See*—
Chernogorenko, Vasily B.; Alzhanov, Tleubai M.; Lynchak, Kima A.; Muchnik, Simon V.; Ishkhanov, Evgeny S.; Sergienko, Vladimir Y.; Sapian, Vladimir G.; Koverya, Vladimir M.; Pobortsev, Mendel E.; Markovsky, Evgeny A.; Dmitrenko, Valentina V.; Bykov, Vladimir I.; Kipchakbaev, Alexandr D.; and Vopilov, Alexandr N., 4,192,853, Cl. 423-122.000.
Vought Corporation: *See*—
McCracken, John, 4,192,234, Cl. 102-67.000.
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Wagaman, Kerry L.: *See*—
Farncomb, Robert E.; Mueller, Kurt F.; and Wagaman, Kerry L., 4,192,819, Cl. 260-583.00N.
Wagemakers, Adrianus J.; Roozen, Johan C. J. A.; and Smit, Jozephus J. M., to U.S. Philips Corporation. Variable capacitor. 4,193,107, Cl. 361-298.000.
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Bickford, David E.; Southard, Robert K.; Sucheski, Matthew M.; and Wagner, Earl W., 4,192,207, Cl. 83-42.000.
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Mohring, Edgar; Wagner, Kuno; and Muller, Hanns P., 4,192,936, Cl. 528-59.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,925, Cl. 521-163.000.
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Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,192,927, Cl. 521-165.000.
Wagner, Otto C.: *See*—
Himy, Albert; and Wagner, Otto C., 4,192,908, Cl. 429-53.000.
Wahl, Pierre: *See*—
Robillard, Jean J., 4,192,048, Cl. 28-246.000.
Wait, Henry J., to Mason & Hanger-Silas Mason Co., Inc. One-man armored vehicle. 4,192,216, Cl. 89-40.00B.
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Waldstrom, Ejvind: *See*—
Krener, Ole G.; and Waldstrom, Ejvind, 4,192,415, Cl. 198-374.000.
Walker, Brooks. Wheeled support for suitcases and like articles. 4,192,408, Cl. 190-18.00A.
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Trace, William L.; and Walker, Jerry L., 4,192,844, Cl. 422-11.000.
Walker, Ralph S.: *See*—
Young, James E.; and Walker, Ralph S., 4,192,303, Cl. 128-214.00R.
Wall, Denton B.: *See*—
Duhl, Daniel; and Wall, Denton B., 4,192,160, Cl. 66-207.000.
Wallop Industries Limited: *See*—
Scott, Andrew M., 4,192,236, Cl. 102-261.000.
Walters, Frank, to Ferranti Limited. Gas discharge display panel. 4,193,017, Cl. 315-169.400.
Walters, Robert A.; Johnson, William L.; and Bivins, Gary W., to ARCO Medical Products Company. Programmable atrio-ventricular pacer. 4,192,316, Cl. 128-419.0PG.
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Wanner, Karl; and Reibetanz, Wilbert, to Robert Bosch GmbH. Power tool. 4,192,390, Cl. 173-75.000.
Ward, James A., to Union Carbide Corporation. Polyelectrolyte hydrogels and methods of their preparation. 4,192,727, Cl. 204-159.120.
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Kastreuz, Gerhard; and Waschk, Volker, 4,192,391, Cl. 173-116.000.
Washington University: *See*—
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,192,020, Cl. 3-1.500.
Washizuka, Isamu; Hashimoto, Shintaro; Kakumae, Masaru; Sato, Yuuichi; Fujisawa, Isao; Inoue, Yukihiro; and Hashimoto, Sadakatsu, to Sharp Kabushiki Kaisha. Method of constructing liquid crystal display. 4,192,060, Cl. 29-592.00R.
Watanabe, Asao: *See*—
Kurahayashi, Sadasuke; Kato, Yuzo; Tsuda, Shin; Muto, Hakaru; and Watanabe, Asao, 4,193,097, Cl. 358-261.000.
Watkins, William L.: *See*—
Gandhi, Haren S.; Watkins, William L.; and Stepien, Henryk K., 4,192,779, Cl. 252-470.000.
Wavin B.V.: *See*—
Graafmann, Jurgen, 4,193,105, Cl. 361-215.000.
Weatherford Lamb, Inc.: *See*—
Schulze-Beckinghausen, Jorg, 4,192,206, Cl. 81-57.180.
Weaver, William N.: *See*—
Platt, John R.; and Weaver, William N., 4,192,096, Cl. 47-73.000.
Webb, Jack E. Railroad roller bearing puller. 4,192,054, Cl. 29-252.000.
Webb, William M., to General Electric Company. Post condenser loop case heater controlled by ambient humidity. 4,192,149, Cl. 62-151.000.
Wech, Robert J., to FMC Corporation. Indexing roll drive system. 4,192,705, Cl. 156-515.000.
Wechsler, Reuben, to Motorola, Inc. Static digital data entry method and apparatus for a timer or clock. 4,192,993, Cl. 235-92.0DE.
Wedemeyer, Karlfried: *See*—
Bauer, Kurt; Krempel, Alfred; Molleken, Reiner; Wedemeyer, Karlfried; and Fiege, Helmut, 4,192,959, Cl. 568-764.000.
Wehrli, Hansuli: *See*—
Anner, Georg; and Wehrli, Hansuli, 4,192,802, Cl. 260-239.570.
Weidler, Charles H.: *See*—
Marks, Richard L.; and Weidler, Charles H., 4,192,568, Cl. 339-91.00R.
Weil, Burt: *See*—
Ferneau, Richard H., 4,192,541, Cl. 296-20.000.
Weimer, James C.; Locks, William S.; Wilson, Edwin B.; and Miller, Francis G., to Bethlehem Steel Corporation. Remote control system for mining machines. 4,192,551, Cl. 299-1.000.
Weingartner, Arthur: *See*—
Ambrosat, Ernest O.; and Weingartner, Arthur, 4,192,447, Cl. 229-72.000.
Weinstock, Joseph, to SmithKline Corporation. 6-Halo-3-lower alkyl-7,8-dihydroxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,192,872, Cl. 424-244.000.
Weiss, Martin J.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,192,950, Cl. 562-500.000.
Weissman, Barry, to Western Electric Company, Inc. High-voltage amplifier with low output impedance. 4,193,040, Cl. 330-293.000.
Welle, Hendricus B. A.; and Claassen, Volkert, to U.S. Philips Corporation. Anti-depressive compounds. 4,192,893, Cl. 424-327.000.
Wellman, Gerald A. Wire reel. 4,192,473, Cl. 242-84.000.
Wennberg, Lennart: *See*—
Thorsell, Walborg; Mikiver, Maarja; Malm, Elisabeth; and Wennberg, Lennart, 4,192,892, Cl. 424-324.000.
Wesoloski, Ronald G.: *See*—
Cerny, Frank J., Jr.; Helm, George D.; and Wesoloski, Ronald G., 4,193,036, Cl. 455-327.000.
Westbay Instruments Ltd.: *See*—
Patton, Franklin D.; and McFarlane, James D., 4,192,181, Cl. 73-155.000.
Wester, Gene W., to California Institute of Technology. Unity power factor converter. 4,193,111, Cl. 363-84.000.
Westerhoff, Heinz; and Riege, Wilhelm. Cooled grate for supporting a workpiece in an oven. 4,192,644, Cl. 432-122.000.

Western Electric Company, Inc.: *See*—
Balde, John W.; Spencer, Robert A.; and Thompson, Richard K., Jr., 4,192,062, Cl. 29-857.000.
Madsen, Bruce S., 4,192,764, Cl. 430-455.000.
Weissman, Barry, 4,193,040, Cl. 330-293.000.
Westinghouse Electric Corp.: *See*—
Blanco, Rodney A.; and Massaro, Anthony A., Jr., 4,192,053, Cl. 29-157.400.
Brewer, Joe E., 4,193,128, Cl. 365-228.000.
Calhoun, Gregory L.; Kramer, Arthur W.; Bauer, Frank I.; and Bencloski, William A., 4,192,067, Cl. 30-379.000.
Edelman, Leonard E., 4,192,933, Cl. 525-377.000.
Hodges, Frank P.; Fowler, Harold W.; and Anderson, Phillip R., 4,192,246, Cl. 114-23.000.
Pierce, Bill L., 4,192,144, Cl. 60-641.000.
Szema, Li-Chieh, 4,192,138, Cl. 60-759.000.
Wade, Elman E., 4,192,558, Cl. 308-6.00R.
Wyler, John S., 4,192,178, Cl. 73-116.000.
Weydemuller, Donald C. Electronic ignition system. 4,192,275, Cl. 123-148.00E.
Weyerhaeuser Company: *See*—
Brookhyser, Byron B.; and Pierson, Darrell E., 4,192,079, Cl. 34-13.800.
White, William G. Door sealing apparatus. 4,192,101, Cl. 49-478.000.
Whiteside, George D.: *See*—
LaRocque, Arthur G.; Whiteside, George D.; and Johnson, Bruce K., 4,192,587, Cl. 354-27.000.
Wich, Robert, to Braun AG. Method of making a shearfoil for dry shavers. 4,192,719, Cl. 204-11.000.
Wickstrom, Lawrence L.; and Garden, Jock C., to Farmland Industries, Inc. Conical roof structure. 4,192,107, Cl. 52-82.000.
Wieland, Gunther: *See*—
Bade, Werner; Gelsdorf, Gunther; and Wieland, Gunther, 4,192,687, Cl. 106-38.240.
Wiesmann, Thomas W.: *See*—
Swerling, Stephen; Smith, Steven R.; and Wiesmann, Thomas W., 4,192,451, Cl. 371-20.000.
Wiggins, Robert W.; Ettenhofer, Kurt L.; and Bess, Jack, to United States of America, Navy. Charging circuit for sonar systems. 4,193,129, Cl. 367-106.000.
Wilderness Mold, Inc.: *See*—
Patenaude, James K., 4,192,104, Cl. 51-273.000.
"Wilhelmstal" Ernst & Sohn GmbH & Co. KG: *See*—
Porth, Erwin, 4,192,448, Cl. 229-80.000.
Willby, Christopher R.: *See*—
Hayden, Owen; Sheward, George E.; Ormrod, Derek T.; Willby, Christopher R.; and Firth, George F., 4,192,374, Cl. 165-158.000.
Willett, Boyd R., to PPG Industries Canada Ltd. Method of disposing solid sodium chloride while selectively solution mining potassium chloride. 4,192,555, Cl. 299-4.000.
Williams, Amos. Apparatus and method for reconstituting seat backs. 4,192,548, Cl. 297-452.000.
Williams, Frank N., to Bradley Corporation. Drain valve ball lever. 4,192,026, Cl. 4-203.000.
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Williams, Ronald S.; and Hill, Robert S., to Arvin Industries, Inc. Tube-to-plate connection. 4,192,531, Cl. 285-222.000.
Williamson, Paul M.: *See*—
Dickey, Charles R.; and Williamson, Paul M., 4,192,758, Cl. 252-33.000.
Willinger, Allan H., to Willinger Bros., Inc. Aquarium airstone device. 4,192,255, Cl. 119-5.000.
Willinger Bros., Inc.: *See*—
Willinger, Allan H., 4,192,255, Cl. 119-5.000.
Willisch, Hannes. Device for preparation and hygienization of refuse or refuse-clarified sludge mixtures by means of composting. 4,192,848, Cl. 422-239.000.
Wilson, Donald L. Surgical incision guide means. 4,192,312, Cl. 128-303.00R.
Wilson, Edwin B.: *See*—
Weimer, James C.; Locks, William S.; Wilson, Edwin B.; and Miller, Francis G., 4,192,551, Cl. 299-1.000.
Wilson, John E., to Deere & Company. Axial flow separator with stepped threshing bar rotor. 4,192,322, Cl. 130-27.00T.
Wingfield, Robert C., Jr., to Ford Motor Company. Corrosion resistant primers. 4,192,929, Cl. 525-110.000.
Winn & Coales (Denso) Limited: *See*—
Parker, William D.; Smith, Harry M.; and Edwards, Margaret P., 4,192,697, Cl. 156-188.000.
Winter Park Associates: *See*—
Merry, Glenn W., 4,192,640, Cl. 430-248.000.
Winther, Svend E.: *See*—
Goldman, Holliday L.; and Winther, Svend E., 4,192,482, Cl. 251-56.000.
Wissmann, Michael: *See*—
Peters, Klaus-Jurgen; Wissmann, Michael; and Schelhas, Peter, 4,192,271, Cl. 123-139.0AW.
Witschard, Gilbert, to Hooker Chemicals & Plastics Corp. Polymer compositions having enhanced low temprature impact resistance on ageing. 4,192,828, Cl. 525-83.000.
Wlodkowski, Johann: *See*—
Jungwirth, Dieter; Renoth, Josef; and Wlodkowski, Johann, 4,192,114, Cl. 52-230.000.
Woerz, Otto: *See*—
Meissner, Bernd; Fliege, Werner; Woerz, Otto; Dudeck, Christian; and Diehm, Hans. 4,192,820, Cl. 260-601.00R.
Wolf, Dieter: *See*—
Rapp, Guenther; Thomas, Erwin; Wolf, Dieter; Kuerten, Heribert; and Zehner, Peter, 4,192,856, Cl. 423-387.000.
Wolf, Rainer, to Sandoz Ltd. Halogenated phosphonitrilic esters. 4,192,830, Cl. 260-973.000.
Wolfkamp, Albertus: *See*—
Avellis, Cosmo L.; Pavone, Carlo; and Wolfkamp, Albertus, 4,192,183, Cl. 73-182.000.
Wolfson, Joseph, to Desenberg, Charles. Orthodontic band and seating tool therefor. 4,192,068, Cl. 433-3.000.
Wolowodiuk, Walter, to Foster Wheeler Energy Corporation. Leak detection system for duplex tube heat exchangers. 4,192,373, Cl. 165-70.000.
WOMA-Apparatebau Wolfgang Maasberg & Co., GmbH: *See*—
Grahac, Mirko, 4,192,343, Cl. 137-474.000.
Womack, D. Gene; and Hignight, Charles G., to Georex Industries, Inc. Helicopter portable earth drilling apparatus. 4,192,393, Cl. 175-103.000.
Wommack, Joel B., Jr.: *See*—
Adams, John B., Jr.; and Wommack, Joel B., Jr., 4,192,669, Cl. 71-108.000.
Wood, Dale A.: *See*—
Elfes, Lee E.; and Wood, Dale A., 4,192,750, Cl. 210-133.000.
Woods, Jay: *See*—
Haslam, Lester H.; Woods, Jay; and Woods, Verle W., 4,192,095, Cl. 47-58.000.
Woods, Verle W.: *See*—
Haslam, Lester H.; Woods, Jay; and Woods, Verle W., 4,192,095, Cl. 47-58.000.
Wor, Jan T.: *See*—
Blom, Nico; and Wor, Jan T., 4,192,230, Cl. 101-93.030.
Worley, Arthur C., to Exxon Research & Engineering Co. Catalyst sampler device. 4,192,188, Cl. 73-424.000.
Wormington, Garold L. Heat exchanger. 4,192,286, Cl. 126-121.000.
Worrell, G. Richard; and McKay, Frank F., Jr., to Atlantic Richfield Company. Method and apparatus for halting the advancement of accidental ethylene decomposition in a gas pipeline. 4,192,656, Cl. 48-192.000.
Worrell, G. Richard, to Atlantic Richfield Company. Method and apparatus for halting the advancement of ethylene decomposition flame fronts. 4,192,657, Cl. 48-192.000.
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Worrell, Robert A., Sr.; and Ross, Richard T., to Scott Paper Company. Flexible and pliable moisture-impervious package. 4,192,420, Cl. 206-205.000.
Wortman, Donald E.: *See*—
Morrison, Clyde A.; Karayianis, Nick; and Wortman, Donald E., 4,193,044, Cl. 331-94.50F.
Wright, Larry G.: *See*—
Milberger, Walter E.; and Wright, Larry G., 4,193,032, Cl. 178-116.000.
Wright, William B., Jr.; and Hardy, Robert A., Jr., to American Cyanamid Company. 5H-Pyrrolo[2,1-c][1,4]benzodiazepine derivatives. 4,192,803, Cl. 260-243.300.
Wu, Yulin, to Phillips Petroleum Company. Preparation of vicinal epoxides. 4,192,810, Cl. 260-348.160.
Wyatt, James L. Pin-hook dispensing and inserting or setting tool. 4,192,437, Cl. 221-255.000.
Wyckoff, Frank K.; and Silver, Roger C., to Atlas Products, Inc. Machine for applying a uniform pressure. 4,192,626, Cl. 404-123.000.
Wykoff, Richard H., to AMSTED Industries Incorporated. Liquid-solid separator. 4,192,747, Cl. 210-83.000.
Wyler, John S., to Westinghouse Electric Corp. Apparatus for determining stagnation pressure, static pressure, pitch angle, and yaw angle of elastic fluid. 4,192,178, Cl. 73-116.000.
Wyslouzil, Walter, to Canadian Patents and Development Limited. Microwave moisture-profile gauge. 4,193,027, Cl. 324-58.50R.
Wytaski, Thomas A.: *See*—
Beuch, Wallace E.; O'Konski, George J.; Rusch, Kenneth D.; and Wytaski, Thomas A., 4,193,102, Cl. 360-105.000.
Xerox Corporation: *See*—
Arase, Shingo; and Lahr, Roy J., 4,193,119, Cl. 364-900.000.
Buck, Kenneth J., 4,192,603, Cl. 355-3.0BE.
Jeromin, Lothar S., 4,192,989, Cl. 219-216.000.
Lu, Chin H., 4,192,902, Cl. 427-127.000.
Perun, William D.; and Amatangelo, Paul C., 4,192,497, Cl. 271-18.000.
Stoffel, James C., 4,193,092, Cl. 358-136.000.
Stoffel, James C., 4,193,096, Cl. 358-260.000.
Wang, Shing C., 4,193,042, Cl. 331-945.0PE.
Yeh, Keming W., 4,193,079, Cl. 357-22.000.
Yaguchi, Masachika; and Kato, Haruhiro, to Dai Nippon Toryo Co, Ltd. Electrochromic display device. 4,192,581, Cl. 350-357.000.
Yamada, Hiroshi: *See*—
Sakamoto, Eiichi; Ishihara, Masao; Nakazato, Kazuo; Yamada, Hiroshi; Terada, Sadatugu; Kitahara, Kenichi; Abe, Naoto; Komiya, Mamoru; and Kanbe, Masaru, 4,192,683, Cl. 430-536.000.
Yamada, Katsuhiko: *See*—
Tsunoi, Haruo; Morikawa, Teruo; Yamada, Katsuhiko; Ohkawara, Kenji; and Kubota, Atsushi, 4,192,229, Cl. 100-158.00R.

Yamada, Takashi: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,192,135, Cl. 368-62.000.
Yamaga, Eiichi; Nakada, Akira; Okumura, Takatoshi; Aoki, Eiichiro; Oya, Akiyoshi; and Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,192,211, Cl. 84-1.010.
Yamaga, Eiichi; Aoki, Eiichiro; and Imamura, Akio, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with automatic performance device. 4,192,212, Cl. 84-1.030.
Yamagiwa, Kazuo; Saito, Kaneo; and Numakura, Toshihiko, to Sony Corporation. Video recorder having means for maintaining constant the amplitude of the frequency-modulated signal. 4,193,084, Cl. 358-4.000.
Yamaguchi, Akihiro: *See*—
Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,192,677, Cl. 430-77.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, 4,192,140, Cl. 60-277.000.
Yamamoto, Ryohei. Elongated shingle assembly. 4,192,115, Cl. 52-468.000.
Yamamoto, Shigehiko: *See*—
Futamoto, Masaaki; Kawabe, Ushio; Hosoki, Shigeyuki; Komoda, Tsutomu; and Yamamoto, Shigehiko, 4,193,013, Cl. 313-341.000.
Yamamoto, Toru, to Teijin Seiki Company Limited. Fail-safe fluid control valve. 4,192,218, Cl. 91-216.00A.
Yamamoto, Yohei: *See*—
Ogata, Shunji; and Yamamoto, Yohei, 4,192,662, Cl. 62-13.000.
Yamashita, Ryuichi; and Matsumoto, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Apparatus and method relating to internal combustion engines utilizing an exhaust gas reactor. 4,192,140, Cl. 60-277.000.
Yamauchi, Hiroki: *See*—
Kitagawa, Katsutoshi; and Yamauchi, Hiroki, 4,192,263, Cl. 123-90.390.
Yamauchi, Yoshiki: *See*—
Houkawa, Kouji; Yamauchi, Yoshiki; and Yoshikawa, Shokichiro, 4,193,045, Cl. 331-107.00A.
Yanagimoto, Takekazu: *See*—
Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, 4,192,594, Cl. 354-90.000.
Yardley Products, Inc.: *See*—
Ziaylek, Theodore, Jr., 4,192,990, Cl. 219-243.000.
Yasuda, Kenzi: *See*—
Suzuki, Masane; and Yasuda, Kenzi, 4,192,578, Cl. 350-320.000.
Yasuda, Syoichi: *See*—
Morita, Toshiaki; Takatori, Hironari; Makino, Fusao; Yasuda, Syoichi; and Nishioka, Yoshiki, 4,193,056, Cl. 340-146.3AC.
Yasuda, Takeru: *See*—
Nonoyama, Takao; and Yasuda, Takeru, 4,192,141, Cl. 60-290.000.
Yasui, Senzi: *See*—
Oidaira, Toshiaki; Asanuma, Katsumi; Yanagimoto, Takekazu; Yasui, Senzi; Saito, Kozo; and Hakamata, Yoshio, 4,192,594, Cl. 354-90.000.
Yasukawa, Jun-ichi: *See*—
Enomoto, Kunio; Kikuchi, Uhee; Kobori, Masanori; Kimura, Suguru; Kamiyama, Satoru; Todoroki, Nobuaki; and Yasukawa, Jun-ichi, 4,192,728, Cl. 204-181.00R.
Yasumatsu, Mutsuo; Shoji, Shinichi; Sakamoto, Koichi; Kurihara, Takao; Terabayashi, Takeshi; and Ohmura, Kasutaka, to Calpis Shokuhin Kogyo Kabushiki Kaisha. Milk-containing acid syrup. 4,192,901, Cl. 426-580.000.
Yeh, Keming W., to Xerox Corporation. MESFET with non-uniform doping. 4,193,079, Cl. 357-22.000.
Yelke, Edward. Piezoelectric transducer for fuel injection engine. 4,192,179, Cl. 73-119.00A.
Yello, Joseph F., to Zenith Radio Corporation. Addressable event display and control system. 4,193,120, Cl. 364-900.000.
Yerman, Arthur J., to Becton, Dickinson and Company. Vented vacuum tube and stopper. 4,192,429, Cl. 215-307.000.
Yobaccio, Edward A., to Polaroid Corporation. Rotatable adapter for use in optically coupling a viewing device with a photographic camera. 4,192,591, Cl. 354-62.000.
Yoneharu, Tanaka: *See*—
Gensho, Takahashi; Masamitsu, Yanai; Masakazu, Kurihara; Yoneharu, Tanaka; and Kazuhiro, Suzuoki, 4,192,684, Cl. 430-284.000.
Yoshida, Makoto, to Citizen Watch Company Limited. Electronic timepiece correction device. 4,192,134, Cl. 368-80.000.
Yoshida, Takashi: *See*—
Udagawa, Tsugio; Araya, Takeshi; and Yoshida, Takashi, 4,192,986, Cl. 219-137.00R.
Yoshida, Toru: *See*—
Ueda, Yuziro; Yoshida, Toru; and Honda, Michiyasu, 4,192,486, Cl. 266-44.000.
Yoshikawa, Shokichiro: *See*—
Houkawa, Kouji; Yamauchi, Yoshiki; and Yoshikawa, Shokichiro, 4,193,045, Cl. 331-107.00A.
Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, to Mitsubishi Gas Chemical Company, Inc. Oxygen absorbent. 4,192,773, Cl. 252-429.00R.
Yoshino, Koichiro: *See*—
Tsukamoto, Goro; Yoshino, Koichiro; Kohno, Toshihiko; Taguchi, Masahiro; Dezawa, Katsumi; Kagaya, Hajime; Ito, Keizo; and Nose, Takashi, 4,192,880, Cl. 424-273.00R.
Young, A. Mark; Henriquez, Theodore A.; and Tims, Allan C., to United States of America, Navy. Fiber optic hydrophone for use as an underwater electroacoustic standard. 4,193,130, Cl. 367-149.000.
Young, James E.; and Walker, Ralph S. Flow regulating device for arterial catheter systems. 4,192,303, Cl. 128-214.00R.
Young, Rodney C.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,192,879, Cl. 424-273.00R.
Yuyama, Megumu: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, 4,192,773, Cl. 252-429.00R.
Yxfeldt, Leif J. Connecting device. 4,192,463, Cl. 239-289.000.
Zahn, Wolfgang: *See*—
Fergg, Berthold; Findeis, Gunter; and Zahn, Wolfgang, 4,192,605, Cl. 355-38.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Hamma, Karlmann; and Ott, Anton, 4,192,199, Cl. 74-687.000.
Zehner, Peter: *See*—
Rapp, Guenther; Thomas, Erwin; Wolf, Dieter; Kuerten, Heribert; and Zehner, Peter, 4,192,856, Cl. 423-387.000.
Zeidler, H. Rudolf, to Zenith Radio Corporation. Electron gun shield cup providing tube evacuation bypass vents. 4,193,016, Cl. 313-449.000.
Zenith Carburetter Company Limited: *See*—
Ross, Gray E. D., 4,192,277, Cl. 123-179.00G.
Zenith Radio Corporation: *See*—
Korpel, Adrianus, 4,193,090, Cl. 358-128.500.
Yello, Joseph F., 4,193,120, Cl. 364-900.000.
Zeidler, H. Rudolf, 4,193,016, Cl. 313-449.000.
Ziaylek, Theodore, Jr., to Yardley Products, Inc. Tip assembly for use with a thermal press. 4,192,990, Cl. 219-243.000.
Ziccardi, John J. Hemorrhage alarms. 4,193,068, Cl. 340-604.000.
Zigmont, Clifford V. Spa lounge. 4,192,024, Cl. 4-172.000.
Zilges, Franz-Josef; and Kutz, Heinrich, to Schloemann-Siemag Aktiengesellschaft. Method and apparatus for the extrusion of tubes of easily oxidized materials. 4,192,162, Cl. 72-45.000.
Zoltai, John T. Electronic authentication system. 4,193,061, Cl. 371-67.000.
Zorzi, Joe: *See*—
Kennedy, Russell J.; Lazier, Samuel S.; and Zorzi, Joe, 4,192,187, Cl. 73-321.000.
Zoske, Karl-Heinz: *See*—
Lang, Thomas; and Zoske, Karl-Heinz, 4,192,272, Cl. 123-140.0MC.
Zuntini, Franco: *See*—
Laude, Pierre; Marka, Erwin; and Zuntini, Franco, 4,192,723, Cl. 204-43.00G.
Zurawski, Vincent R., Jr., to Massachusetts General Hospital. Process for rosetting human B lymphocytes with Rhesus monkey erythrocyte. 4,192,917, Cl. 435-236.000.
Zyliss Zysset AG: *See*—
Hartmann, Horst, 4,192,470, Cl. 241-169.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MARCH, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bahder, George: *See*—
Silver, David A.; and Bahder, George, Re. 30,228, Cl. 174-36.000.

Berman, Paul A.; Giras, Theodore C.; Crews, Roy E.; and Ziegelman, Robert L., to Ziegelman, Robert L. Modular operating centers and methods of building same for use in electric power generating plants and other industrial and commercial plants, processes and systems. Re. 30,229, Cl. 290-1.00R.

Cannell, Roger D.: *See*—
Louis, Joseph E.; and Cannell, Roger D., Re. 30,226, Cl. 417-216.000.

Ciba-Geigy Corporation: *See*—
von Rutte, Richard; and Gasser, Walter, Re. 30,227, Cl. 252-301.220.

Crews, Roy E.: *See*—
Berman, Paul A.; Giras, Theodore C.; Crews, Roy E.; and Ziegelman, Robert L., Re. 30,229, Cl. 290-1.00R.

Daugherty, Donald A.: *See*—
Simmons, John H.; and Daugherty, Donald A., Re. 30,225, Cl. 164-45.000.

Gasser, Walter: *See*—
von Rutte, Richard; and Gasser, Walter, Re. 30,227, Cl. 252-301.220.

General Cable Corporation: *See*—
Silver, David A.; and Bahder, George, Re. 30,228, Cl. 174-36.000.

Giras, Theodore C.: *See*—
Berman, Paul A.; Giras, Theodore C.; Crews, Roy E.; and Ziegelman, Robert L., Re. 30,229, Cl. 290-1.00R.

Louis, Joseph E.; and Cannell, Roger D., to Sundstrand Corporation. Torque limiting control. Re. 30,226, Cl. 417-216.000.

Ortega, Robert, to Purex Corporation. Valve construction. Re. 30,224, Cl. 137-625.470.

Precision Metalsmiths, Inc.: *See*—
Simmons, John H.; and Daugherty, Donald A., Re. 30,225, Cl. 164-45.000.

Purex Corporation: *See*—
Ortega, Robert, Re. 30,224, Cl. 137-625.470.

Silver, David A.; and Bahder, George, to General Cable Corporation. Power cable with corrugated or smooth longitudinally folded metallic shielding tape. Re. 30,228, Cl. 174-36.000.

Simmons, John H.; and Daugherty, Donald A., to Precision Metalsmiths, Inc. Method and apparatus for feeding granulated material. Re. 30,225, Cl. 164-45.000.

Sundstrand Corporation: *See*—
Louis, Joseph E.; and Cannell, Roger D., Re. 30,226, Cl. 417-216.000.

von Rutte, Richard; and Gasser, Walter, to Ciba-Geigy Corporation. Agent for brightening and removing greyness from textiles. Re. 30,227, Cl. 252-301.220.

Ziegelman, Robert L.: *See*—
Berman, Paul A.; Giras, Theodore C.; Crews, Roy E.; and Ziegelman, Robert L., Re. 30,229, Cl. 290-1.00R.

LIST OF PLANT PATENTEES

Pan-American Plant Company: *See*—
Shoesmith, Leonard H., 4,509, Cl. 74.000.
Shoesmith, Leonard H., 4,510, Cl. 74.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Gettysburg. 4,509, 3-11-80, Cl. 74.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Anthem. 4,510, 3-11-80, Cl. 74.000.

LIST OF DESIGN PATENTEES

Abbate, Jack, to Regency Service Carts, Inc. Insulated bowl. 254,416, 3-11-80, Cl. D7-22.000.

Adams, Jim M., to Projects in Health, Inc. Peak expiratory flow meter or similar article. 254,443, 3-11-80, Cl. D24-17.000.

Amity Leather Products Co.: *See*—
Gajewski, Dennis A., 254,414, Cl. D6-172.000.

Backstrom, Olof F., to Oy Fiskars AB. Hairdresser's scissors. 254,420, 3-11-80, Cl. D8-57.000.

Backstrom, Olof F., to Oy Fiskars AB. Nail scissors. 254,421, 3-11-80, Cl. D8-57.000.

Bakal, Peter A. Switchboard console for a telecommunications system. 254,436, 3-11-80, Cl. D14-58.000.

Bataca, Inc.: *See*—
Reinhard, Carl W., 254,440, Cl. D21-211.000.

Battaglia, Anthony. Hand held hair dryer. 254,451, 3-11-80, Cl. D28-13.000.

Boghosian, Robert A., to Warner-Lambert Company. Chromatography column. 254,445, 3-11-80, Cl. D24-56.000.

Borucki, Robert L., to Graco Metal Products, Inc. Seat for baby swing. 254,409, 3-11-80, Cl. D6-10.000.

Brouwer, Ryk V., to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,403, 3-11-80, Cl. D2-431.000.

Brouwer, Ryk V., to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,404, 3-11-80, Cl. D2-431.000.

Brouwer, Ryk V., to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,406, 3-11-80, Cl. D2-431.000.

Brouwer, Ryk V., to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,407, 3-11-80, Cl. D2-431.000.

Brouwer, Ryk V., to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,408, 3-11-80, Cl. D2-431.000.

Brouwer, RykV., to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,405, 3-11-80, Cl. D2-431.000.

Broyhill Manufacturing Company, The: *See*—
Broyhill, Roy F.; Parsons, James; Schroeder, Ralph; and Stewart, Clarence E., 254,431, Cl. D12-97.000.

Broyhill, Roy F.; Parsons, James; Schroeder, Ralph; and Stewart, Clarence E., to Broyhill Manufacturing Company, The. Utility vehicle. 254,431, 3-11-80, Cl. D12-97.000.

Carlson, Arthur W. Flat frankfurter. 254,396, 3-11-80, Cl. D1-26.000.

Cervone, David P. Air cleaner. 254,442, 3-11-80, Cl. D23-149.000.

Clugston, George D. Combined feeder and waterer for pets. 254,454, 3-11-80, Cl. D30-16.000.

Coffey, James M. Catamaran wind vane. 254,430, 3-11-80, Cl. D12-70.000.

Concord Laboratories: *See*—
Raitto, Russell G., 254,446, Cl. D24-99.000.

Cornwell, Alexander M., Jr.; and Miller, Joseph N., to Jackes-Evans Manufacturing Company. Mailbox. 254,455, 3-11-80, Cl. D99-29.000.

Dattner, Richard. Shelter. 254,448, 3-11-80, Cl. D25-18.000.

DeMars, Robert A.; and Thor, John D. Detachable handle for a beverage can or the like. 254,417, 3-11-80, Cl. D7-70.000.

DeMars, Robert A.; and Thor, John D. Combined opener and handle for a beverage can. 254,419, 3-11-80, Cl. D8-34.000.

Doukas, Peter J. Building. 254,449, 3-11-80, Cl. D25-33.000.

Erie Crate and Manufacturing Company: *See*—
Van Geem, John D., 254,423, Cl. D9-177.000.

Fabreeka Products Company: *See*—
Summers, Frank B., Jr., 254,429, Cl. D12-60.000.

Ferron, James R., to GTE Automatic Electric Laboratories Incorporated. Housing for a telephone set. 254,435, 3-11-80, Cl. D14-53.000.

Finn, Norman H., to United States Shoe Corporation, The. Open toe wedgie sneaker. 254,397, 3-11-80, Cl. D2-296.000.
Finn, Norman H., to United States Shoe Corporation, The. Wedgie sneaker. 254,398, 3-11-80, Cl. D2-286.000.
Fredrick, William H. Nestable shipping container. 254,424, 3-11-80, Cl. D9-246.000.
Fredriksson, Lars O. A., to K A Bergs Smide AB. Combined hook and anchorage plate. 254,422, 3-11-80, Cl. D8-367.000.
Gageby, Steven D. Chair. 254,410, 3-11-80, Cl. D6-56.000.
Gajewski, Dennis A., to Amity Leather Products Co. Display case. 254,414, 3-11-80, Cl. D6-172.000.
Graco Metal Products, Inc.: *See—*
Borucki, Robert L., 254,409, Cl. D6-10.000.
GTE Automatic Electric Laboratories Incorporated: *See—*
Ferron, James R., 254,435, Cl. D14-53.000.
Hoshino, Kunio; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Inc. Motor vehicular citizens' band transceiver. 254,438, 3-11-80, Cl. D14-68.000.
Hoshino, Kunio: *See—*
Ohta, Kikuo; Hoshino, Kunio; and Murakami, Tsutomu, 254,437, Cl. D14-68.000.
Hurco Manufacturing Company, Inc.: *See—*
Roch, Gerald V., 254,433, Cl. D13-12.000.
Iijima, Takekazu, to Pioneer Kabushiki Kaisha. Loudspeaker. 254,434, 3-11-80, Cl. D14-30.000.
Jackes-Evans Manufacturing Company: *See—*
Cornwell, Alexander M., Jr.; and Miller, Joseph N., 254,455, Cl. D99-29.000.
K A Bergs Smide AB: *See—*
Fredriksson, Lars O. A., 254,422, Cl. D8-367.000.
Kingsford, Ted I., to Plough, Inc. Modular width adjustable, spring fed display dispensing element. 254,415, 3-11-80, Cl. D6-191.000.
Knight, Kenneth F. Cabinet for holding a roll of toilet paper. 254,412, 3-11-80, Cl. D6-97.000.
Lasowski, Mark A.; and Lasowski, Richard. Desk ornament or similar article. 254,428, 3-11-80, Cl. D11-157.000.
Lasowski, Richard: *See—*
Lasowski, Mark A.; and Lasowski, Richard, 254,428, Cl. D11-157.000.
Lemoine, Kenneth D. Water distiller. 254,441, 3-11-80, Cl. D23-3.000.
Levine, Robert A. Blood sampling needle. 254,444, 3-11-80, Cl. D24-54.000.
Marlin Fiberglass: *See—*
Reineman, Richard G., 254,447, Cl. D24-38.000.
Matsushita Electric Industrial Co., Inc.: *See—*
Hoshino, Kunio; and Ohta, Kikuo, 254,438, Cl. D14-68.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Ohta, Kikuo; Hoshino, Kunio; and Murakami, Tsutomu, 254,437, Cl. D14-68.000.
McMahan, Forrest E.: *See—*
Pulse, Herschel F.; McSherry, William F.; and McMahan, Forrest E., 254,450, Cl. D25-89.000.
McSherry, William F.: *See—*
Pulse, Herschel F.; McSherry, William F.; and McMahan, Forrest E., 254,450, Cl. D25-89.000.
Miller, Joseph N.: *See—*
Cornwell, Alexander M., Jr.; and Miller, Joseph N., 254,455, Cl. D99-29.000.
Mitutoyo Mfg., Co., Ltd.: *See—*
Nishina, Shingo; and Nakaoki, Tokuzo, 254,425, Cl. D10-73.000.
Murakami, Tsutomu: *See—*
Ohta, Kikuo; Hoshino, Kunio; and Murakami, Tsutomu, 254,437, Cl. D14-68.000.
Nakaoki, Tokuzo: *See—*
Nishina, Shingo; and Nakaoki, Tokuzo, 254,425, Cl. D10-73.000.
Nishina, Shingo; and Nakaoki, Tokuzo, to Mitutoyo Mfg., Co., Ltd. Dial indicator. 254,425, 3-11-80, Cl. D10-73.000.
Norenberg, Lowell G. Paint stirring paddle. 254,418, 3-11-80, Cl. D7-102.000.
North American Philips Corporation: *See—*
Rakocy, William J.; and Rauch, Howard L., 254,452, Cl. D28-35.000.
Nottingham, John R.; and Spirk, John W., Jr. Toy chest. 254,439, 3-11-80, Cl. D21-121.000.
Ohta, Kikuo; Hoshino, Kunio; and Murakami, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Motor vehicular citizens' band transceiver. 254,437, 3-11-80, Cl. D14-68.000.
Ohta, Kikuo: *See—*
Hoshino, Kunio; and Ohta, Kikuo, 254,438, Cl. D14-68.000.
Olko, Henry. Chair. 254,411, 3-11-80, Cl. D6-57.000.
Oy Fiskars AB: *See—*
Backstrom, Olof F., 254,420, Cl. D8-57.000.
Backstrom, Olof F., 254,421, Cl. D8-57.000.
Parsons, James: *See—*
Broyhill, Roy F.; Parsons, James; Schroeder, Ralph; and Stewart, Clarence E., 254,431, Cl. D12-97.000.
Perrier, Robert, to Testut-Aequitas. Scale. 254,426, 3-11-80, Cl. D10-91.000.
Perrier, Robert, to Testut-Aequitas. Scale. 254,427, 3-11-80, Cl. D10-91.000.
Pioneer Kabushiki Kaisha: *See—*
Iijima, Takekazu, 254,434, Cl. D14-30.000.
Plough, Inc.: *See—*
Kingsford, Ted I., 254,415, Cl. D6-191.000.
Pool, Dan L. Holder for rolled paper. 254,413, 3-11-80, Cl. D6-97.000.
Projects in Health, Inc.: *See—*
Adams, Jim M., 254,443, Cl. D24-17.000.
Pulse, Herschel F.; McSherry, William F.; and McMahan, Forrest E. Building block. 254,450, 3-11-80, Cl. D25-89.000.
Raintree Buckle & Jewelry, Inc.: *See—*
Brouwer, Ryk V., 254,403, Cl. D2-431.000.
Brouwer, Ryk V., 254,404, Cl. D2-431.000.
Brouwer, Ryk V., 254,406, Cl. D2-431.000.
Brouwer, Ryk V., 254,407, Cl. D2-431.000.
Brouwer, Ryk V., 254,408, Cl. D2-431.000.
Brouwer, RykV., 254,405, Cl. D2-431.000.
Van Brouwer, Ryk, 254,399, Cl. D2-431.000.
Van Brouwer, Ryk, 254,400, Cl. D2-431.000.
Van Brouwer, Ryk, 254,401, Cl. D2-431.000.
Van Brouwer, Ryk, 254,402, Cl. D2-431.000.
Raitto, Russell G., to Concord Laboratories. Blood gas syringe stopper. 254,446, 3-11-80, Cl. D24-99.000.
Rakocy, William J.; and Rauch, Howard L., to North American Philips Corporation. Curling iron. 254,452, 3-11-80, Cl. D28-35.000.
Rauch, Howard L.: *See—*
Rakocy, William J.; and Rauch, Howard L., 254,452, Cl. D28-35.000.
Regency Service Carts, Inc.: *See—*
Abbate, Jack, 254,416, Cl. D7-22.000.
Reineman, Richard G., to Marlin Fiberglass. Hydrotherapy spa. 254,447, 3-11-80, Cl. D24-38.000.
Reinhard, Carl W., to Bataca, Inc. Game club with unitary handle. 254,440, 3-11-80, Cl. D21-211.000.
Roch, Gerald V., to Hurco Manufacturing Company, Inc. Bending press gauge control panel. 254,433, 3-11-80, Cl. D13-12.000.
Schessl, Ronald G. Wheel chock unit. 254,432, 3-11-80, Cl. D12-217.000.
Schroeder, Ralph: *See—*
Broyhill, Roy F.; Parsons, James; Schroeder, Ralph; and Stewart, Clarence E., 254,431, Cl. D12-97.000.
Spirk, John W., Jr.: *See—*
Nottingham, John R.; and Spirk, John W., Jr., 254,439, Cl. D21-121.000.
Stewart, Clarence E.: *See—*
Broyhill, Roy F.; Parsons, James; Schroeder, Ralph; and Stewart, Clarence E., 254,431, Cl. D12-97.000.
Strong, Robert W. Pet fountain. 254,453, 3-11-80, Cl. D30-13.000.
Summers, Frank B., Jr., to Fabreeka Products Company. Conveyor belt. 254,429, 3-11-80, Cl. D12-60.000.
Testut-Aequitas: *See—*
Perrier, Robert, 254,426, Cl. D10-91.000.
Perrier, Robert, 254,427, Cl. D10-91.000.
Thor, John D.: *See—*
DeMars, Robert A.; and Thor, John D., 254,417, Cl. D7-70.000.
DeMars, Robert A.; and Thor, John D., 254,419, Cl. D8-34.000.
United States Shoe Corporation, The: *See—*
Finn, Norman H., 254,397, Cl. D2-296.000.
Finn, Norman H., 254,398, Cl. D2-286.000.
Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,399, 3-11-80, Cl. D2-431.000.
Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,400, 3-11-80, Cl. D2-431.000.
Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,401, 3-11-80, Cl. D2-431.000.
Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 254,402, 3-11-80, Cl. D2-431.000.
Van Geem, John D., to Erie Crate and Manufacturing Company. Bottle crate. 254,423, 3-11-80, Cl. D9-177.000.
Warner-Lambert Company: *See—*
Boghosian, Robert A., 254,445, Cl. D24-56.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 11, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

12 4,192,017
19 4,192,018
239 4,192,019

CLASS 3

1.5 4,192,020
1.9 4,192,021
13 4,192,022

CLASS 4

7 4,192,023
172 4,192,024
172.14 4,192,025
203 4,192,026
441 4,192,027

CLASS 5

181 4,192,028
420 4,192,030
441 4,192,029
451 4,192,031
497 4,192,032

CLASS 8

62 4,192,647
86 4,192,648
138 4,192,649

CLASS 12

10.1 4,192,033

CLASS 13

7 4,192,962

CLASS 15

21 A 4,192,034
22 R 4,192,035
53 AB 4,192,036
53 B 4,192,037
250.06 4,192,038

CLASS 16

86 B 4,192,039

CLASS 17

11 4,192,040

CLASS 19

0.35 4,192,041
81 4,192,042

CLASS 24

21 4,192,043
211 R 4,192,044

CLASS 26

75 4,192,045

CLASS 28

151 4,192,046
220 4,192,047
246 4,192,048

CLASS 29

2 4,192,049
148.4 D 4,192,050
156.6 4,192,051
157.3 A 4,192,052
157.4 4,192,053
252 4,192,054
281.4 4,192,055
458 4,192,057
468 4,192,056
526 A 4,192,058
571 4,192,059
591 4,192,063
592 R 4,192,060
631 4,192,064
854 4,192,061
857 4,192,062

CLASS 30

43.6 4,192,065
162 4,192,066
379 4,192,067

CLASS 33

27 L 4,192,072
178 B 4,192,073
228 4,192,074
257 4,192,075
296 4,192,076
313 4,192,077
414 4,192,078

CLASS 34

13.8 4,192,079
41 4,192,080
225 4,192,081

CLASS 35

10.4 4,192,082
16 4,192,083
18 A 4,192,084
31 E 4,192,085

CLASS 36

44 4,192,086
119 4,192,087

CLASS 37

3 4,192,088
142 A 4,192,089

CLASS 40

591 4,192,090
615 4,192,091

CLASS 44

1 R 4,192,650
1 SR 4,192,651
10 R 4,192,652
51 4,192,653

CLASS 46

123 4,192,092
204 4,192,093
207 4,192,094

CLASS 47

58 4,192,095
59 4,192,097
73 4,192,096

CLASS 48

62 R 4,192,654
191 4,192,655
192 4,192,656
4,192,657
4,192,658

CLASS 49

91 4,192,098
366 4,192,099
404 4,192,100
478 4,192,101

CLASS 51

103 R 4,192,102
249 4,192,103
273 4,192,104

CLASS 52

2 4,192,105
36 4,192,106
82 4,192,107
90 4,192,108
108 4,192,109
111 4,192,110
171 4,192,111
222 4,192,112
230 4,192,114
282 4,192,113
468 4,192,115
469 4,192,116
478 4,192,117
588 4,192,119
714 4,192,118
741 4,192,120

CLASS 53

248 4,192,121
572 4,192,122

CLASS 55

89 4,192,659
276 4,192,660

CLASS 56

13.6 4,192,123
27.5 4,192,124
328 R 4,192,125

CLASS 57

3 4,192,126
7 4,192,127
290 4,192,128
301 4,192,129

CLASS 60

39.16 R 4,192,137
277 4,192,140
290 4,192,141
322 4,192,142
4,192,143
641 4,192,144
675 4,192,145
739 4,192,139
759 4,192,138

CLASS 62

2 4,192,146
12 4,192,661
13 4,192,662
49 4,192,147
116 4,192,148
151 4,192,149
277 4,192,150
320 4,192,151
402 4,192,152

CLASS 64

17 R 4,192,153
21 4,192,154
23 4,192,155

CLASS 65

11 R 4,192,663
22 4,192,664
33 4,192,665
4,192,666
374 RM 4,192,667

CLASS 66

64 4,192,156
76 4,192,157
146 4,192,158
203 4,192,159
207 4,192,160

CLASS 70

455 4,192,161

CLASS 71

70 4,192,668
108 4,192,669
121 4,192,670
4,192,671

CLASS 72

45 4,192,162
114 4,192,163
234 4,192,164
238 4,192,165
347 4,192,166
356 4,192,167
389 4,192,168
405 4,192,169
414 4,192,170
416 4,192,171
420 4,192,172

CLASS 73

11 4,192,173
19 4,192,174
4,192,175
28 4,192,176
49.5 4,192,177
116 4,192,178
119 A 4,192,179
121 4,192,180
155 4,192,181
4,192,182
182 4,192,183
194 B 4,192,184
243 4,192,185
303 4,192,186
321 4,192,187
424 4,192,188
505 4,192,189
665 4,192,190
701 4,192,191
715 4,192,192
739 4,192,193
794 4,192,194

CLASS 74

7 A 4,192,195
339 4,192,196
380 4,192,197
384 4,192,198
687 4,192,199
690 4,192,200
859 4,192,201
863 4,192,202
4,192,203

CLASS 75

0.5 C 4,192,672
4,192,673
10 R 4,192,674
60 4,192,675
72 4,192,676

CLASS 81

43 4,192,204
53.2 4,192,205
57.18 4,192,206

CLASS 83

42 4,192,207
438 4,192,208
564 4,192,209

CLASS 84

1.01 4,192,210
4,192,211
1.03 4,192,212
293 4,192,213
327 4,192,214

CLASS 85

36 4,192,215
41 4,192,217

CLASS 89

40 B 4,192,216

CLASS 91

216 A 4,192,218
276 4,192,219
376 R 4,192,220
487 4,192,221
517 4,192,222

CLASS 92

5 R 4,192,223
125 4,192,224
169 4,192,225

CLASS 93

1 C 4,192,226

CLASS 99

279 4,192,227

CLASS 100

37 4,192,228
158 R 4,192,229

CLASS 101

93.03 4,192,230
425 4,192,231
426 4,192,232

CLASS 102

43 P 4,192,233
67 4,192,234
214 4,192,235
261 4,192,236

CLASS 104

7 B 4,192,237

CLASS 105

133 4,192,238
199 R 4,192,239
225 4,192,240

CLASS 106

1.23 4,192,686
38.24 4,192,687
39.7 4,192,688
52 4,192,689
99 4,192,690
291 4,192,691

CLASS 112

117 4,192,241
262.2 4,192,242
273 4,192,243

CLASS 113

121 C 4,192,244

CLASS 114

23 4,192,245
4,192,246
39 4,192,247
56 4,192,248
61 4,192,249

CLASS 118

52 4,192,250
63 4,192,251
258 4,192,252
712 4,192,253

CLASS 119

1 4,192,254
5 4,192,255
51.5 4,192,256
81 4,192,257

CLASS 122

6.5 4,192,258
136 R 4,192,259
182 R 4,192,260

CLASS 123

58 B 4,192,261
75 B 4,192,262
90.39 4,192,263
119 A 4,192,264
4,192,265
4,192,266
4,192,267
119 EC 4,192,268
122 A 4,192,270
122 F 4,192,269
139 AW 4,192,271
140 MC 4,192,272
141 4,192,273
142.5 R 4,192,274
148 E 4,192,275
179 G 4,192,277
179 K 4,192,276
198 F 4,192,278
4,192,279

CLASS 124

23 R 4,192,280
25 4,192,281

CLASS 125

23 T 4,192,282

CLASS 126

25 AA 4,192,283
38 4,192,284
83 4,192,285
121 4,192,286
286 4,192,310
343.5 A 4,192,288
425 4,192,289
427 4,192,454
437 4,192,290
439 4,192,291
448 4,192,292
449 4,192,287

CLASS 128

1 D 4,192,293
1 R 4,192,294
52 4,192,296
66 4,192,297
155 4,192,299
4,192,300
203.15 4,192,309
205.17 4,192,301
205.24 4,192,298
214 R 4,192,302
4,192,303
214.4 4,192,304
4,192,305
4,192,306
252 4,192,307
260 4,192,308
287 4,192,311
295 4,192,295
303 R 4,192,312
321 4,192,313
322 4,192,314
346 4,192,315
419 PG 4,192,316
646 4,192,317
708 4,192,318
748 4,192,319
764 4,192,320
776 4,192,321

CLASS 130

27 T 4,192,322

CLASS 131

135 4,192,323
149 4,192,324

CLASS 132

9 4,192,325
34 R 4,192,326
37 R 4,192,328
41 A 4,192,327
79 R 4,192,329
91 4,192,330

CLASS 134

2 4,192,692
77 4,192,331
167 R 4,192,332

CLASS 135

3 E 4,192,333
4 R 4,192,334

CLASS 137

1 4,192,335
15.1 4,192,336
101 4,192,337
106 4,192,338
223 4,192,339
245.5 4,192,342
344 4,192,340
445 4,192,341
474 4,192,343
489.3 4,192,344
572 4,192,345
599 4,192,346
614.06 4,192,347
624.15 4,192,348
625.47 Re.30,224
878 4,192,349

CLASS 138

30 4,192,350
126 4,192,351
149 4,192,352

CLASS 139

307 4,192,353
342 4,192,354
435 4,192,355
439 4,192,356
450 4,192,357

CLASS 140

123.6 4,192,358

CLASS 141

12 4,192,359
24 4,192,360
82 4,192,361
177 4,192,362

CLASS 144

145 A 4,192,363
193 A 4,192,364

CLASS 148

2 4,192,693
6.11 4,192,694
32 4,192,695
101 4,192,696

CLASS 150

35 4,192,365

CLASS 152

209 R 4,192,366
225 C 4,192,367
362 R 4,192,368

CLASS 156

89 4,192,698
145 4,192,699
188 4,192,697
272 4,192,700
285 4,192,701
416 4,192,702
443 4,192,703
4,192,704
515 4,192,705
643 4,192,706

CLASS 160

223 4,192,369

CLASS 162

3 4,192,707
49 4,192,708
111 4,192,709
198 4,192,710
199 4,192,711
265 4,192,712
358 4,192,713

CLASS 164

45 Re.30,225
252 4,192,370

CLASS 165

1 4,192,371
5 4,192,372
70 4,192,373
158 4,192,374

CLASS 166

51 4,192,375
53 4,192,376
70 4,192,377
186 4,192,378
250 4,192,379
4,192,380
261 4,192,381
269 4,192,382
341 4,192,383
356 4,192,384

CLASS 169

56 4,192,385

CLASS 171

58 4,192,386

CLASS 172

21 4,192,387
463 4,192,388

CLASS 173

15 4,192,389
75 4,192,390
116 4,192,391

CLASS 174

6 4,192,963
36 Re.30,228
73 R 4,192,964
135 4,192,965

CLASS 175

66 4,192,392
103 4,192,393

CLASS 176

22 4,192,714
30 4,192,715
78 4,192,716
87 4,192,717
4,192,718

CLASS 177

45 4,192,394

CLASS 178

3 4,192,966
22 4,192,967
116 4,193,032

CLASS 179

1 G 4,192,969
1 GS 4,192,968
4,192,970
6 E 4,192,971
6.3 R 4,192,972
16 F 4,192,974
77 4,192,975
90 K 4,192,976
111 E 4,192,977
170 NC 4,192,978
170.2 4,192,979

CLASS 180

6.5 4,192,395
68.5 4,192,397
170 4,192,399
178 4,192,398
252 4,192,396
287 4,192,400

CLASS 181

256 4,192,402
266 4,192,401
268 4,192,403
272 4,192,404

CLASS 182

185 4,192,406

CLASS 188

170 4,192,405
196 R 4,192,407

CLASS 190

18 A 4,192,408

CLASS 192

4 A 4,192,410
4 R 4,192,409
36 4,192,411
105 CD 4,192,412
106.2 4,192,413
129 R 4,192,414

CLASS 198

374 4,192,415
433 4,192,416
601 4,192,417
659 4,192,418
750 4,192,419

CLASS 200

83 WM 4,192,980
144 B 4,192,981
157 4,192,982

CLASS 204

11 4,192,719
14 N 4,192,720
4,192,721
38 B 4,192,722
43 G 4,192,723
67 4,192,724
98 4,192,725
129 4,192,726
159.12 4,192,727
181 R 4,192,728
272 4,192,729
294 4,192,730

CLASS 206

205 4,192,420
426 4,192,421
528 4,192,422
586 4,192,423

CLASS 208

8 LE 4,192,731
33 4,192,732
4,192,733
80 4,192,734
112 4,192,735
251 H 4,192,736

CLASS 209

5 4,192,737
4,192,738
166 4,192,739

CLASS 210

3 4,192,740
6 4,192,741
17 4,192,742
42 R 4,192,743
54 4,192,744
66 4,192,745
73 S 4,192,746
83 4,192,747
87 4,192,748
107 4,192,749
133 4,192,750
136 4,192,751
298 4,192,752

CLASS 211

37 4,192,424
50 4,192,425
105.4 4,192,426

CLASS 212

8 R 4,192,427

CLASS 215

256 4,192,428
307 4,192,429

CLASS 219

76.1 4,192,983
76.17 4,192,984
121 EM 4,192,985
137 PS 4,192,987
137 R 4,192,986
201 4,192,988
216 4,192,989
243 4,192,990
413 4,192,991
494 4,192,992

CLASS 220

1.5 4,192,430
62 4,192,431
83 4,192,432
200 4,192,433
306 4,192,434
331 4,192,435

CLASS 221

129 4,192,436
255 4,192,437

CLASS 222

5 4,192,438
130 4,192,439
528 4,192,440

CLASS 223

96 4,192,441

CLASS 226

127 4,192,442

CLASS 229

28 R 4,192,443
4,192,444
35 4,192,445
37 R 4,192,446
72 4,192,447
80 4,192,448

CLASS 234

111 4,192,449

CLASS 235

92 DE 4,192,993
95 R 4,192,450
471 4,192,452

CLASS 236

87 4,192,453

CLASS 237

8 R 4,192,455
12.3 C 4,192,457
12.3 R 4,192,456
51 4,192,458

CLASS 238

356 4,192,459

CLASS 239

79 4,192,460
265.17 4,192,461
288 4,192,462
289 4,192,463
373 4,192,464
405 4,192,465
464 4,192,466

CLASS 241

34 4,192,467
101.7 4,192,468
121 4,192,469
169 4,192,470
185 R 4,192,471
215 4,192,472

CLASS 242

84 4,192,473
107.4 A 4,192,474

CLASS 244

3.16 4,192,475
83 K 4,192,476

CLASS 248

56 4,192,477
222.3 4,192,478
354 H 4,192,479
436 4,192,480

CLASS 249

42 4,192,481

CLASS 250

280 4,192,994
338 4,192,995
373 4,192,996
385 4,193,000
445 T 4,192,997
4,193,001
479 4,193,002
492 A 4,193,003
502 4,192,998
561 4,192,999
577 4,193,004

CLASS 251

56 4,192,482
172 4,192,483
173 4,192,484

CLASS 252

8.5 A 4,192,753
8.55 D 4,192,755
8.55 R 4,192,756
8.8 4,192,754
32.7 E 4,192,757
33 4,192,758
78.1 4,192,759
79 4,192,760
99 4,192,761
182 4,192,762
187 H 4,192,763
301.1 W 4,192,765
301.22 Re.30,227
305 4,192,766
312 4,192,767
389 R 4,192,768
4,192,769
414 4,192,770
415 4,192,771
429 B 4,192,774
429 C 4,192,772
429 R 4,192,773
430 4,192,775
432 4,192,776
447 4,192,777
455 Z 4,192,778
470 4,192,779
518 4,192,780
522 R 4,192,781
4,192,782

CLASS 254

187.5 4,192,485

CLASS 260

8 4,192,783
4,192,784
17.4 GC 4,192,785
18 EP 4,192,786
21 4,192,787
27 R 4,192,788
29.2 E 4,192,789
31.2 MR 4,192,790
40 R 4,192,791
42.14 4,192,792
4,192,793
42.45 4,192,794
42.52 4,192,795
45.85 S 4,192,796
112.5 R 4,192,798
121 4,192,799
205 4,192,800
239 A 4,192,801
239.57 4,192,802
243.3 4,192,803
340.5 R 4,192,805
340.7 4,192,806
343.6 4,192,807
345.2 4,192,808
346.71 4,192,809
348.16 4,192,810
397.25 4,192,811
406 4,192,812
410.9 R 4,192,813
429 R 4,192,814
453 P 4,192,815
465 D 4,192,816
513 N 4,192,817
566 AE 4,192,818
583 N 4,192,819
597 R 4,192,942
601 R 4,192,820
652 P 4,192,821
653 4,192,822
658 R 4,192,823
948 4,192,829
973 4,192,830
987 4,192,831

CLASS 261

36 R 4,192,832
4,192,833
52 4,192,834
114 A 4,192,835
142 4,192,836

CLASS 264

3 E 4,192,837
10 4,192,838
45.5 4,192,839
61 4,192,840
117 4,192,841
298 4,192,842
528 4,192,843

CLASS 266

44 4,192,486
58 4,192,487
77 4,192,488
88 4,192,489
225 4,192,490
245 4,192,491
281 4,192,492

CLASS 267

74 4,192,493

CLASS 269

289 R 4,192,494

CLASS 271

10 4,192,495
4,192,496
18 4,192,497
21 4,192,498

CLASS 272

56.5 R 4,192,499
68 4,192,500
75 4,192,501
119 4,192,502

CLASS 273

29 A 4,192,503
33 4,192,504
73 C 4,192,505
73 R 4,192,506
118 A 4,192,508
157 R 4,192,509
176 A 4,192,510
176 G 4,192,511
243 4,192,512
294 4,192,513
311 4,192,507

CLASS 274

1 A 4,192,514

CLASS 277

11 4,192,515
12 4,192,516
24 4,192,517
27 4,192,518
115 4,192,519
235 B 4,192,520

CLASS 279

112 4,192,521

CLASS 280

154.5 R 4,192,522
400 4,192,523
415 A 4,192,524
443 4,192,525
477 4,192,526
618 4,192,527
677 4,192,528
689 4,192,529
802 4,192,530

CLASS 285

222 4,192,531
248 4,192,532
334 4,192,533
382.2 4,192,534

CLASS 290

1 R Re.30,229
44 4,193,005

CLASS 292

37 4,192,535
228 4,192,536
264 4,192,537

CLASS 293

134 4,192,538

CLASS 294

19 R 4,192,539
87.2 4,192,540

CLASS 296

20 4,192,541
159 4,192,543
165 4,192,544
173 4,192,542

CLASS 297

216 4,192,545
452 4,192,547
4,192,548
464 4,192,549
466 4,192,546

CLASS 299

1 4,192,550
4,192,551
2 4,192,552
4,192,553
4,192,554
4 4,192,555
56 4,192,556

CLASS 303

114 4,192,557

CLASS 307

117 4,193,006
291 4,193,007

CLASS 308

6 R 4,192,558
36.1 4,192,559
187 4,192,560

CLASS 310

321 4,193,008
323 4,193,009
330 4,193,010

CLASS 312

42 4,192,561
108 4,192,562
134 4,192,563
253 4,192,564

CLASS 313

94 4,193,011
137 4,193,012
341 4,193,013
396 4,193,014
408 4,193,015
449 4,193,016

CLASS 315

169.4 4,193,017
408 4,193,018

CLASS 318

13 4,193,019
314 4,193,020
568 4,193,021
592 4,193,022

CLASS 323

19 4,193,023

CLASS 324

58.5 R 4,193,027
237 4,193,028
301 4,193,029
313 4,193,024
427 4,193,025
428 4,193,026

CLASS 328

46 4,193,037
104 4,193,038
162 4,193,039

CLASS 330

293 4,193,040

CLASS 331

65 4,193,041
94.5 F 4,193,044
94.5 PE 4,193,043
107 A 4,193,045
109 4,193,046
945 PE 4,193,042

CLASS 333

17 L 4,193,047
26 4,193,048
141 4,193,049
165 4,193,050
201 4,193,051

CLASS 335

128 4,193,052

CLASS 337

275 4,193,053

CLASS 338

42 4,193,054

CLASS 339

17 CF 4,192,565
47 R 4,192,566
75 M 4,192,567
91 R 4,192,568
96 4,192,569
98 4,192,570
103 M 4,192,571
111 4,192,572

CLASS 340

27 AT 4,193,059
52 D 4,193,060
146.3 AC 4,193,056
200 4,193,063
309.4 4,193,064
323 R 4,193,065
347 CC 4,193,066
546 4,193,067
604 4,193,068
630 4,193,069
650 4,193,070
723 4,193,071

CLASS 343

6 ND 4,193,072
6 R 4,193,073
16 M 4,193,074
108 M 4,193,075
702 4,193,076
747 4,193,077

CLASS 346

76 R 4,193,078

CLASS 350

55 4,192,573
96.17 4,192,574
96.21 4,192,575
105 4,192,576
184 4,192,577
227 4,192,579
238 4,192,580
320 4,192,578
357 4,192,581

CLASS 351

30 4,192,582

CLASS 353

3 4,192,583
30 4,192,584
101 4,192,585

CLASSIFICATION OF PATENTS

CLASS 354

24	4,192,586
27	4,192,587
43	4,192,588
53	4,192,589
	4,192,590
62	4,192,591
76	4,192,592
86	4,192,593
90	4,192,594
133	4,192,595
142	4,192,596
145	4,192,597
153	4,192,598
173	4,192,599
212	4,192,600
293	4,192,601
346	4,192,602

CLASS 355

3 BE	4,192,603
3 DD	4,192,604
38	4,192,605
40	4,192,606
50	4,192,607
51	4,192,608
77	4,192,609

CLASS 356

33	4,192,610
320	4,192,611
381	4,192,612
386	4,192,613
410	4,192,614

CLASS 357

22	4,193,079
23	4,193,080
30	4,193,081
80	4,193,082
	4,193,083

CLASS 358

4	4,193,084
8	4,193,085
10	4,193,086
93	4,193,087
95	4,193,088
111	4,193,089
128.5	4,193,090
	4,193,091
136	4,193,092
160	4,193,093
190	4,193,094
241	4,193,095
260	4,193,096
261	4,193,097

CLASS 360

10	4,193,098
17	4,193,099
73	4,193,100
97	4,193,101
105	4,193,102
122	4,193,103

CLASS 361

56	4,193,104
215	4,193,105
275	4,193,106
298	4,193,107
399	4,193,108

CLASS 362

34	4,193,109
371	4,193,110

CLASS 363

84	4,193,111

CLASS 364

200	4,193,112
	4,193,113
	4,193,114
300	4,193,115
556	4,193,116
728	4,193,117
734	4,193,118
900	4,193,119
	4,193,120
	4,193,121
	4,193,122
	4,193,123

CLASS 365

12	4,193,124
104	4,193,125
174	4,193,126
	4,193,127
228	4,193,128

CLASS 366

65	4,192,615
79	4,192,616
83	4,192,617

CLASS 367

71	4,193,058
94	4,193,055
106	4,193,129
149	4,193,130
153	4,193,057

CLASS 368

62	4,192,135
73	4,192,133
80	4,192,134
155	4,192,130
157	4,192,131
160	4,192,132
222	4,192,136

CLASS 370

53	4,192,973

CLASS 371

20	4,192,451
43	4,193,062
67	4,193,061

CLASS 375

2	4,193,030
	4,193,131
88	4,193,033
	4,193,034

CLASS 400

124	4,192,618
163	4,192,619

CLASS 402

15	4,192,620

CLASS 403

	4,192,621
146	4,192,622
232.1	4,192,623
295	4,192,624

CLASS 404

5	4,192,625
123	4,192,626

CLASS 405

45	4,192,628
76	4,192,627
128	4,192,629
217	4,192,630
261	4,192,631
298	4,192,632

CLASS 416

221	4,192,633

CLASS 417

216	Re.30,226

CLASS 418

61 A	4,192,634

CLASS 422

11	4,192,844
25	4,192,845
168	4,192,846
198	4,192,847
239	4,192,848
242	4,192,849
255	4,192,850

CLASS 423

28	4,192,851
42	4,192,852
122	4,192,853
220	4,192,854
239	4,192,855
387	4,192,856
576	4,192,857

CLASS 424

1	4,192,858
5	4,192,859
43	4,192,860
47	4,192,861
	4,192,862
72	4,192,863
122	4,192,864
153	4,192,865
154	4,192,866
180	4,192,867
	4,192,868
199	4,192,869
240	4,192,870
241	4,192,871
244	4,192,872
246	4,192,873
248.54	4,192,874
256	4,192,875
258	4,192,876
	4,192,877
270	4,192,878
273 R	4,192,879
	4,192,880
	4,192,881
274	4,192,882
	4,192,883
275	4,192,884
	4,192,885
283	4,192,886
	4,192,887
305	4,192,891
308	4,192,890
309	4,192,889
321	4,192,888
324	4,192,892
327	4,192,893
329	4,192,894
331	4,192,895
346	4,192,896

CLASS 425

71	4,192,635
96	4,192,636
140	4,192,637
256	4,192,638
372	4,192,639

CLASS 426

60	4,192,897
250	4,192,898
513	4,192,899
579	4,192,900
580	4,192,901

CLASS 427

127	4,192,902

CLASS 428

8	4,192,903
36	4,192,904
80	4,192,905

CLASS 429

13	4,192,906
40	4,192,907
53	4,192,908
91	4,192,909
101	4,192,910
104	4,192,911
105	4,192,912
119	4,192,913
206	4,192,914

CLASS 430

77	4,192,677
214	4,192,678
	4,192,679
248	4,192,680
283	4,192,685
284	4,192,684
373	4,192,681
380	4,192,680
405	4,192,682
455	4,192,764
536	4,192,683

CLASS 431

15	4,192,641
263	4,192,642

CLASS 432

106	4,192,643
122	4,192,644
144	4,192,645
239	4,192,646

CLASS 433

3	4,192,068
11	4,192,070
21	4,192,069
93	4,192,071

CLASS 435

78	4,192,915
236	4,192,917
256	4,192,918
274	4,192,916
292	4,192,919

CLASS 455

38	4,193,031
203	4,193,035
327	4,193,036

CLASS 521

31	4,192,920
38	4,192,921
56	4,192,922
117	4,192,923
126	4,192,924
163	4,192,925
	4,192,926
165	4,192,927
177	4,192,928

CLASS 525

83	4,192,828
110	4,192,929
123	4,192,827
227	4,192,930
243	4,192,797
377	4,192,933
425	4,192,826
489	4,192,931
511	4,192,932

CLASS 526

62	4,192,934
348.6	4,192,935

CLASS 528

59	4,192,936
	4,192,937
67	4,192,938
313	4,192,939
370	4,192,940
374	4,192,941
417	4,192,943

CLASS 544

282	4,192,944

CLASS 546

245	4,192,945
249	4,192,946

CLASS 548

177	4,192,804
334	4,192,947

CLASS 560

55	4,192,948
67	4,192,949

CLASS 562

500	4,192,950
549	4,192,951

CLASS 568

574	4,192,952
673	4,192,953
723	4,192,954
724	4,192,955
726	4,192,956
	4,192,957
763	4,192,958
764	4,192,959
816	4,192,960

CLASS 585

319	4,192,961
719	4,192,825

CLASS 855

409	4,192,824

CLASSIFICATION OF DESIGNS

D1—	26	254,396
D2—	286	254,398
	296	254,397
	431	254,399
		254,400
		254,401
		254,402
		254,403
		254,404
		254,405
		254,406
		254,407
		254,408
D6—	10	254,409
	56	254,410
	57	254,411
	97	254,412
		254,413
	172	254,414
	191	254,415
D7—	22	254,416
	70	254,417
	102	254,418
D8—	34	254,419
	57	254,420
		254,421
	367	254,422
D9—	177	254,423
	246	254,424
D10—	73	254,425
	91	254,426
		254,427
		254,428
D11—	157	254,428
D12—	60	254,429
	70	254,430
	97	254,431
	217	254,432
D13—	12	254,433
D14—	30	254,434
	53	254,435
	58	254,436
	68	254,437
		254,438
D21—	121	254,439
	211	254,440
D23—	3	254,441
	149	254,442
D24—	17	254,443
	38	254,447
	54	254,444
	56	254,445
	99	254,446
D25—	18	254,448
	33	254,449
	89	254,450
D28—	13	254,451
	35	254,452
D30—	13	254,453
	16	254,454
D99—	29	254,455

CLASSIFICATION OF PLANTS

P.—	74	4,509
		4,510

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,192,270
2 : 4,192,630
6 : 4,192,122
4,192,311
4,192,312
4,192,319
4,192,349
4,192,408
4,192,499
4,192,507
4,192,602
4,192,736
4,193,083
4,193,088
4,193,119
8 : 4,192,473
9 : 4,192,560
4,192,614
4,192,716
4,192,739
4,192,964
4,193,087
01 : 4,192,976
04 : 4,192,362
4,192,365
4,192,449
4,192,627
4,192,695
4,192,832
4,192,993
4,193,118
06 : Re.30,224
4,192,022
4,192,024
4,192,059
4,192,066
4,192,071
4,192,074
4,192,077
4,192,091
4,192,092
4,192,094
4,192,118
4,192,173
4,192,183
4,192,190
4,192,194
4,192,210
4,192,217
4,192,221
4,192,248
4,192,254
4,192,275
4,192,295
4,192,308
4,192,309
4,192,317
4,192,375
4,192,381
4,192,425
4,192,437
4,192,454
4,192,465
4,192,476
4,192,483
4,192,508
4,192,510
4,192,552
4,192,554
4,192,565
4,192,586
4,192,601
4,192,625
4,192,703
4,192,729
4,192,753
4,192,758
4,192,778
4,192,798
4,192,898
4,192,899
4,192,900
4,192,905
4,192,939
4,192,967
4,192,978
4,192,989
4,192,995
4,192,996
4,193,007
4,193,010
4,193,020
4,193,042
4,193,047
4,193,057
4,193,062
4,193,073
4,193,079
4,193,093
4,193,098
4,193,108
4,193,111
08 : 4,192,176
4,192,393
4,192,553
4,192,555
4,192,676
4,193,004
4,193,100
09 : 4,192,097
4,192,116
4,192,226
4,192,292
4,192,293
4,192,328
4,192,498
4,192,790
4,192,906
4,192,907
4,192,984
4,193,049
10 : 4,192,090
4,192,669
4,192,826
4,192,943
11 : 4,192,203
12 : 4,192,032
4,192,112
4,192,125
4,192,266
4,192,269
4,192,280
4,192,301
4,192,359
4,192,477
4,192,526
4,192,606
4,193,048
4,193,065
4,193,112
4,193,130
13 : 4,192,075
4,192,360
4,192,481
4,192,540
4,192,544
4,192,584
4,192,693
15 : 4,192,296
4,192,313
16 : 4,192,054
4,192,095
4,192,335
17 : 4,192,018
4,192,026
4,192,086
4,192,096
4,192,108
4,192,179
4,192,192
4,192,193
4,192,227
4,192,240
4,192,283
4,192,305
4,192,306
4,192,322
4,192,325
4,192,447
4,192,478
4,192,480
4,192,500
4,192,502
4,192,503
4,192,505
4,192,506
4,192,512
4,192,534
4,192,580
4,192,596
4,192,726
4,192,746
4,192,783
4,192,855
4,192,867
4,192,897
4,192,909
4,192,916
4,192,919
4,192,965
4,192,968
4,192,980
4,193,009
4,193,016
4,193,022
4,193,036
4,193,053
4,193,090
4,193,094
4,193,103
4,193,116
4,193,120
4,193,123
18 : 4,192,028
4,192,285
4,192,326
4,192,399
4,192,411
4,192,531
4,192,539
4,192,670
4,192,884
4,192,913
4,192,955
4,193,031
19 : Re.30,226
4,192,076
4,192,291
4,192,386
4,192,432
4,192,456
4,192,468
4,192,622
4,192,626
4,192,766
20 : 4,192,107
4,192,225
4,192,256
4,192,337
4,192,364
4,192,866
21 : 4,192,149
4,192,216
4,192,387
4,192,564
4,192,812
22 : 4,192,069
4,192,377
4,192,735
23 : 4,192,646
24 : 4,192,031
4,192,082
4,192,235
4,192,246
4,192,300
4,192,522
4,192,559
4,192,573
4,192,611
4,192,819
4,192,908
4,192,979
4,192,994
4,193,029
4,193,032
4,193,044
4,193,066
4,193,115
4,193,128
25 : 4,192,017
4,192,020
4,192,030
4,192,101
4,192,104
4,192,152
4,192,163
4,192,168
4,192,178
4,192,244
4,192,289
4,192,358
4,192,385
4,192,459
4,192,513
4,192,567
4,192,587
4,192,591
4,192,593
4,192,597
4,192,640
4,192,661
4,192,698
4,192,709
4,192,854
4,192,877
4,192,910
4,192,917
4,193,005
4,193,054
4,193,069
4,193,081
26 : 4,192,027
4,192,052
4,192,055
4,192,161
4,192,189
4,192,196
4,192,396
4,192,401
4,192,427
4,192,441
4,192,530
4,192,532
4,192,561
4,192,615
4,192,701
4,192,747
4,192,750
4,192,779
4,192,795
4,192,799
4,192,808
4,192,885
4,192,911
4,192,929
4,192,932
4,192,948
4,192,991

4,192,992
4,193,039
4,193,060
4,193,067
4,193,113
27 : 4,192,081
4,192,331
4,192,338
4,192,348
4,192,423
4,192,443
4,192,462
4,192,576
4,192,623
4,192,738
4,192,768
4,192,988
4,193,006
4,193,028
4,193,101
4,193,102
29 : 4,192,072
4,192,073
4,192,151
4,192,281
4,192,286
4,192,329
4,192,436
4,192,440
4,192,444
4,192,485
4,192,751
4,192,834
31 : 4,192,215
4,192,524
32 : 4,192,273
4,192,458
4,192,504
34 : 4,192,056
4,192,062
4,192,068
4,192,083
4,192,150
4,192,188
4,192,219
4,192,247
4,192,282
4,192,320
4,192,373
4,192,429
4,192,464
4,192,496
4,192,572
4,192,634
4,192,720
4,192,734
4,192,777
4,192,780
4,192,782
4,192,785

4,192,792
4,192,796
4,192,803
4,192,809
4,192,814
4,192,816
4,192,817
4,192,829
4,192,843
4,192,859
4,192,861
4,192,874
4,192,876
4,192,878
4,192,881
4,192,882
4,192,888
4,192,889
4,192,891
4,192,912
4,192,945
4,192,952
4,192,983
4,193,030
4,193,040
4,193,055
4,193,064
4,193,109
35 : 4,193,043
4,193,061
36 : Re.30,228
4,192,035
4,192,038
4,192,045
4,192,070
4,192,078
4,192,119
4,192,160
4,192,204
4,192,255
4,192,267
4,192,288
4,192,299
4,192,304
4,192,318
4,192,330
4,192,332
4,192,372
4,192,422
4,192,433
4,192,438
4,192,439
4,192,487
4,192,497
4,192,527
4,192,538
4,192,543
4,192,548
4,192,583
4,192,603

4,192,607
4,192,619
4,192,665
4,192,678
4,192,679
4,192,691
4,192,727
4,192,741
4,192,765
4,192,822
4,192,827
4,192,828
4,192,842
4,192,847
4,192,850
4,192,902
4,192,923
4,192,924
4,192,944
4,192,950
4,192,956
4,192,957
4,192,970
4,193,026
4,193,072
4,193,074
4,193,075
4,193,077
4,193,082
4,193,092
4,193,096
4,193,104
4,193,131
37 : 4,192,121
4,192,136
4,192,323
4,192,355
4,192,394
4,192,525
4,192,546
4,192,648
4,192,838
38 : 4,192,347
39 : Re.30,225
4,192,034
4,192,049
4,192,105
4,192,113
4,192,172
4,192,274
4,192,339
4,192,366
4,192,405
4,192,407
4,192,412
4,192,418
4,192,421
4,192,431
4,192,516
4,192,519

4,192,541
4,192,570
4,192,571
4,192,633
4,192,663
4,192,667
4,192,672
4,192,688
4,192,694
4,192,702
4,192,725
4,192,769
4,192,775
4,192,776
4,192,841
4,192,895
4,192,918
4,192,974
4,193,012
4,193,021
4,193,089
4,193,122
40 : 4,192,117
4,192,184
4,192,378
4,192,484
4,192,810
4,192,825
4,193,059
41 : 4,192,340
4,192,451
4,192,472
4,192,549
42 : Re.30,229
4,192,053
4,192,067
4,192,138
4,192,144
4,192,207
4,192,209
4,192,213
4,192,214
4,192,238
4,192,239
4,192,245
4,192,316
4,192,341
4,192,406
4,192,420
4,192,434
4,192,442
4,192,482
4,192,492
4,192,542
4,192,551
4,192,558
4,192,566
4,192,568
4,192,575
4,192,642

4,192,650
4,192,653
4,192,656
4,192,657
4,192,658
4,192,659
4,192,664
4,192,666
4,192,689
4,192,699
4,192,714
4,192,731
4,192,764
4,192,787
4,192,844
4,192,872
4,192,875
4,192,920
4,192,921
4,192,933
4,192,941
4,192,954
4,192,981
4,192,990
4,193,018
4,193,063
4,193,068
4,193,078
4,193,129
43 : 4,192,536
44 : 4,192,166
4,192,903
45 : 4,192,127
4,192,252
4,192,395
4,192,550
4,192,791
46 : 4,192,388
47 : 4,192,019
4,192,445
4,192,453
4,192,457
4,192,501
4,192,794
4,192,811
4,192,896
48 : 4,192,051
4,192,171
4,192,182
4,192,191
4,192,200
4,192,201
4,192,234
4,192,241
4,192,243
4,192,302
4,192,342
4,192,379
4,192,380
4,192,382

4,192,383
4,192,384
4,192,515
4,192,517
4,192,533
4,192,592
4,192,651
4,192,652
4,192,755
4,192,756
4,192,767
4,192,770
4,192,788
4,192,823
4,192,835
4,192,942
4,192,951
4,193,019
4,193,037
4,193,058
4,193,106
4,193,124
49 : 4,192,303
4,192,737
4,192,858
4,193,126
50 : 4,192,547
4,193,127
51 : 4,192,064
4,192,290
4,192,400
4,192,722
4,192,754
4,192,887
4,193,011
4,192,029
4,192,058
4,192,079
4,192,186
4,192,336
4,192,389
4,192,424
4,192,493
4,192,963
54 : 4,192,177
4,192,327
4,192,631
4,192,647
4,192,762
4,192,789
55 : 4,192,098
4,192,100
4,192,103
4,192,307
4,192,639
4,192,705
4,192,712
4,192,805
4,193,025
56 : 4,192,618

DESIGN PATENTS

04 : 254,413
05 : 254,441
06 : 254,399
254,400
254,401
254,402
254,403
254,404
254,405

254,406
254,407
254,408
254,417
254,418
254,419
254,424
254,430
254,440

254,447
09 : 254,444
12 : 254,451
17 : 254,428
18 : 254,433
254,450
20 : 254,454
24 : 254,449
25 : 254,397

254,398
254,429
27 : 254,410
29 : 254,455
31 : 254,431
33 : 254,446
34 : 254,445
254,452

36 : 254,411
254,416
254,435
254,436
254,448
254,453
39 : 254,439
254,442

40 : 254,432
42 : 254,409
254,423
45 : 254,443
47 : 254,415
48 : 254,412
49 : 254,396
55 : 254,414

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